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American Foundryman

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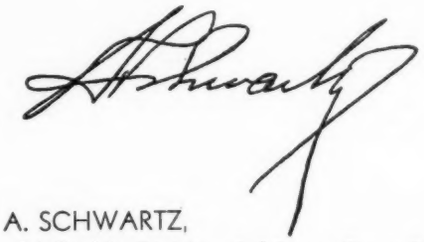
The Cast Metals Handbook

OF THE writing of handbooks, there is no end. Some are well nigh indispensable and some are not worth shelf room. A good handbook should be: (1) Authoritative, (2) Brief, (3) Complete.

Plainly, a book upon which reliance cannot be placed is worse than useless. Commonly producers have more accurate and complete knowledge of their products than consumers. The data of the Cast Metals Handbook have largely been gathered by or in cooperation with the best informed producers but, lest there be any suggestion that they are ex parte information, the source when possible has been a publication in the proceedings of a reputable technical society which guarantees, as far as possible, that the data have been critically discussed.

A book which contains too much data renders the useful data inaccessible. The Cast Metals Handbook has attempted to exclude mere descriptive padding. It happens that this writer thinks that there is still some information of interest to foundrymen rather than engineers, but the descriptive matter is well separated from the data and should not be objectionable.

Completeness can only be approached, not reached. There are always matters still speculative or controversial which, if omitted, deprive the reader of perhaps essential information, but which may turn out to be in error. The Cast Metals Handbook has tried to treat such matters in a general and qualitative style, giving no excuse to the reader for accepting specific quantitative facts where only general knowledge exists, but at any rate apprising him of the trend of opinion in the less understood fields.



H. A. SCHWARTZ,
Malleable Division Advisory Committee.

Dr. H. A. Schwartz, manager of research, National Malleable & Steel Castings Co., Cleveland, is recognized throughout the world as an authority on malleable iron. This recognition has been brought about partly through the many papers and articles he has presented before a number of organizations and to the technical press on the various phases, both practical and theoretical, of malleable iron. For his contributions to the industry, he was awarded the John A. Penton Gold Medal of A.F.A. in 1930 and the E. J. Fox Gold Medal of the Institute of British Foundrymen in 1939. Dr. Schwartz has long been an active committee worker in A.F.A. and at present is serving as Chairman of the Mallable Iron Division Committee on Specifications, as a member of the Advisory Committee, as A.F.A. representative on A.S.T.M. Committees A-7 and E-4, as well as a member of the International Relations Committee.

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American Foundryman

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Chicago Convention and Exhibit Plans Take Form

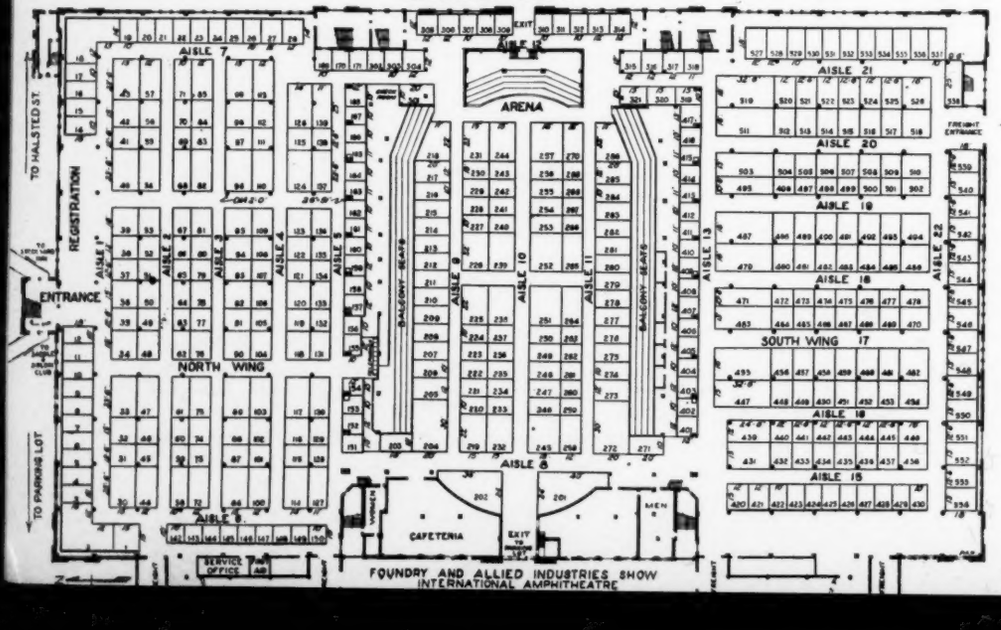
ENTHUSIASM, following the announcement that the 44th Annual A.F.A. Convention and Foundry and Allied Industries Show would be staged in Chicago, May 4-10, led those connected with the staging of those events to believe that the 1940 Convention and Exhibit would be the best and largest held in recent years and possibly in the annals of the Association.

That these beliefs were correct is shown by the fact that in a recent release, C. E. Hoyt, manager of exhibits, stated that "the 1940 Foundry and Allied Industries Show, May 4-10, as indicated by exhibition space requests, will be the most extensive and interesting ever staged." This interest is due undoubtedly to the central location of Chicago as a foundry center, to developments made in foundry equipment since the last show was held in 1938, to better business conditions, and to the unusual exhibit facilities of the International Amphitheatre, where the exhibit will be held.

Facilities and services are available in the Amphitheatre for practically any type of exhibit and for this reason many companies which manufacture equipment and supplies, not only for casting manufacture but also for processing castings, are interested in the Show. Since a large proportion of the foundries also operate machine shops, pattern shops, plating, polishing and finishing departments and laboratories and therefore are interested in equipment and supplies applicable to those departments, firms manufacturing those articles are being admitted to the Show this year. The 1940 Foundry and Allied Industries Show offers an opportunity not only to observe equipment and supplies for the production of castings but also for processing them. The Show will give a broad picture of the foundry industry.

Those who plan to attend the Show may gain some idea of the layout of exhibit space from the accompanying illustration. It will be a definite aid to them in visualizing the Show and will assist them in their plans to see this show in its entirety.

Layout of Exhibit Space for 1940 Foundry and Allied Industries Show



Location of Exhibits

Non-operating exhibits will be located in the North Wing with the operating exhibits in the Arena and South Wing. The South Wing also will include some non-operating exhibits of companies who elect to be with the operating exhibits because of visitor interest in that section.

Registration Headquarters

Registration Headquarters will be located at the entrance to the exhibit in the North Wing. Entrance to the exhibit has been chosen because of its central location with regard to the exhibit and the technical sessions. The latter will be held in the Stock Yard Inn and Saddle and Sirloin Club, immediately adjacent to the Amphitheatre, and in a special room on the second floor of that building during exhibit hours. When exhibit is closed, sessions will be held in downtown hotels.

Centralized Activities

Because of this plan of activities and the restaurant facilities available in the Amphitheatre, members and guests need make only one round trip from their hotels. All activities during the day will be centralized within an area of two city blocks.

Chicago Day

So that foundrymen of the Chicago territory may have the opportunity of seeing "The Foundry Industry on Parade," Saturday, May 4, has been designated as Chicago Day. It is anticipated that thousands of executives, superintendents, foremen, apprentices, students, and members of clerical and office forces in the territory, many of whom will be busy during convention week with plant operations for the benefit of visiting foundrymen, will take advantage of this opportunity.

Plant Visitation

Plant visitations, one of the major attractions of the week, will start Monday afternoon, May 6, with a special group trip inspection of the mills and blast furnaces of the Wisconsin Steel Division of International Harvester Company. During the week, many of the foundries and industrial plants of the district will be open for small group or individual inspection trips.

Technical Program

Opening on Monday, May 6, the convention sessions, shop practice courses and division round table luncheons will begin and continue throughout the week, providing for the presentation of numerous papers and committee reports. In addition to the regular technical sessions of the steel, malleable, gray iron and non-ferrous divisions, general interest sessions on sand research, apprentice and foreman training, plant equipment, foundry costs, refractories, safety methods, patternmaking and time study will be scheduled.

A feature of the technical meetings will be a demonstration entitled "Close-Ups of Crystal Behavior Illustrated by Microprojections," by Dr. C. W. Mason, Cornell University, Ithaca, N. Y. Dr. Mason has developed a spectacular demonstration showing how metals act when cooling from the liquid to the solid state, forming crystals, grain boundaries, eutectics and inclusions. This demonstration is pronounced by those who have seen it to be most instructive to persons working with cast metals.

Program Committees

The development of the program of technical meetings is under the direction of several of the Association committees as follows:

Gray Iron

G. P. Phillips, International Harvester Co., Chicago, *Chairman.*

H. Kenneth Briggs, Miller & Co., Chicago.

R. A. Clark, Lakey Foundry Co., Muskegon, Michigan.

H. A. Deane, American Brake Shoe & Foundry Co., Mahwah, N. J.

R. G. McElwee, Vanadium Corp. of America, Detroit, Mich.

F. J. Walls, International Nickel Co., Detroit, Michigan.

Steel

T. N. Armstrong, International Nickel Co., New York City, *Chairman.*

H. H. Blosjo, Minneapolis Electric Steel Casting Co., Minneapolis, Minn.

J. W. Bolton, The Lunkenheimer Co., Cincinnati, O.

E. Bremer, *The Foundry*, Cleveland, O.

Johannes Erler, Farrel-Birmingham Co., Ansonia, Conn.

L. E. Everett, Key Co., E. St. Louis, Ill.

W. C. Hartmann, Bethlehem Steel Co., Bethlehem, Pa.

G. A. Lilliequist, American Steel Foundries, E. Chicago, Ind.

D. C. Zuege, Sivyer Steel Casting Co., Milwaukee, Wis.

Malleable Iron

C. F. Joseph, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich., *Chairman.*

R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

E. J. Ash, University of Michigan, Ann Arbor, Michigan.

Ben Butterworth, Union Malleable Iron Co., E. Moline, Ill.

D. I. Dobson, General Malleable Corp., Waukesha, Wis.

A. D. Forbes, Gunite Foundries Corp., Rockford, Illinois.

A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn.

K. H. Hamblin, Palmyra Foundry Co., Palmyra, New Jersey.

J. H. Lansing, Malleable Founders' Society, Cleveland, O.

C. C. Lawson, Wagner Malleable Iron Co., Decatur, Ill.

W. D. McMillan, International Harvester Co., Chicago.

G. A. Schumacher, Albion Malleable Iron Co., Albion, Mich.

F. L. Wolf, Ohio Brass Co., Mansfield, O.

Non-Ferrous

R. W. Parsons, Ohio Brass Co., Mansfield, O., *Chairman.*

M. V. Healey, General Electric Co., Schenectady, New York.

L. W. Kempf, Aluminum Co. of America, Cleveland, O.

J. E. McNulty, McKinnon Industries, St. Catherines, Ont., Canada.

W. H. Romanoff, H. Kramer & Co., Chicago.

T. C. Watts, Falcon Bronze Co., Youngstown, O.

F. S. Wellman, Wellman Bronze & Aluminum Co., Cleveland, O.

N. A. Ziegler, Crane Co., Chicago.

Sand Research

W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

C. P. Randall, Hunt-Spiller Mfg. Co., Boston, Massachusetts.

Dr. H. Ries, Ithaca, N. Y.

Job Evaluation and Time Study

F. E. Wartgow, American Steel Foundries, E. Chicago, Ind., *Chairman.*

Eugene Bouton, J. I. Case Co., Racine, Wis.

R. C. Harrell, Stockham Pipe Fittings Co., Birmingham, Ala.

E. J. Metzger, Falcon Bronze Co., Youngstown, Ohio.

H. C. Robson, Continental Roll & Steel Foundry Co., E. Chicago, Ind.

Jeff. Alan Westover, Burnside Steel Foundry Co., Chicago.

Foreman Training

A. D. Lynch, J. I. Case Co., Racine, Wis., *Chairman.*

W. G. Conner, Jr., Walworth Co., Greensburg, Pennsylvania.

W. E. George, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.

Geo. J. Leroux, National Malleable & Steel Castings Co., Cleveland, O.

(Continued on Page 12)

Cast Crank and Cam Shafts*

By H. Jungbluth, Germany.

(Translated by W. H. Spencer, Wilkening Mfg. Co., Philadelphia.)

CAST crankshafts have been known for a long time. The Krupp catalog of 1902 mentions cast steel crankshafts for locomotives.

The cost of producing a cast crankshaft is as great or greater than the cost of a forging. The cost of machining the casting, however, is less than that of the forging. There are other reasons more important than cost which favor the castings over the forgings for crankshafts.

Graphite in the cast iron or malleable iron gives valuable properties such as lower modulus of elasticity, reduced sensitivity to a notch effect, increased damping capacity, and good wear resistance.

The lower modulus of elasticity in graphite bearing iron gives the advantage of lower stresses in torsion. Under equal torsion test conditions, a cast crankshaft was not damaged in an hour and a half, while a forged shaft broke in half that time.

The numerous graphite inclusions act as internal notches and render the material much less sensitive to external notches than is the case with steel. The fatigue limits of steel and cast iron, both notched, under alternating stresses are much closer than would be supposed from their strengths measured statically. Table 1 shows the results of alternate bending tests.

Another consideration is important in metal for crankshafts; namely, damping capacity or the value of the fraction of the energy transmitted to a body which does not appear in the form of vibrations, but in the form of heat. In cast iron, this damping is produced well below the fatigue limit. Thum and Ude found, by measuring the temperature of the test specimen, that in a cast iron having a fatigue limit of 8500 lb. per sq. in., damping was present for a load of 2800 lb. per sq. in.

The damping capacity varies proportionally to the graphite content, or better, to the graphitization. Vibrations are damped more rapidly in test specimens having coarse graphite taken from the center of a test bar, than in test specimens taken from nearer the wall where the graphite is finer and the graphite content is lower. Fig. 1 illustrates this point.

Finally, the good wear resistance of cast iron should be mentioned. This property also is due to the presence of graphite which is itself lubricating and, when removed, it leaves minute cavities which retain an oil film.

There three types of cast metal suitable for crankshafts:

1. Pearlitic cast iron, with or without small additions of alloys and with or without heat treatment.
2. Martensitic cast irons, drawn for machineability.
3. Malleable type cast irons, annealed to 250-300 Brinell hardness, having a pearlitic structure.

Table 1.
Fatigue Limit of Steel and Cast Iron (Mailander).

MATERIAL	STRENGTH		FATIGUE LIMIT			
			Without Notch		With Notch	
	Lb. /sq. in.	Relative Value C.I.=1.00	Lb. /sq. in.	Relative Value C.I.=1.00	Lb. /sq. in.	Relative Value C.I.=1.00
Cast Iron	41,200	1.00	18,500	1.00	18,500	1.00
Steel	54,000	1.32	29,900	1.62	19,900	1.08
Steel	83,900	2.04	41,100	2.23	25,600	1.39

*Technische Mitteilungen Krupp, Aug. 1938, p. 88.

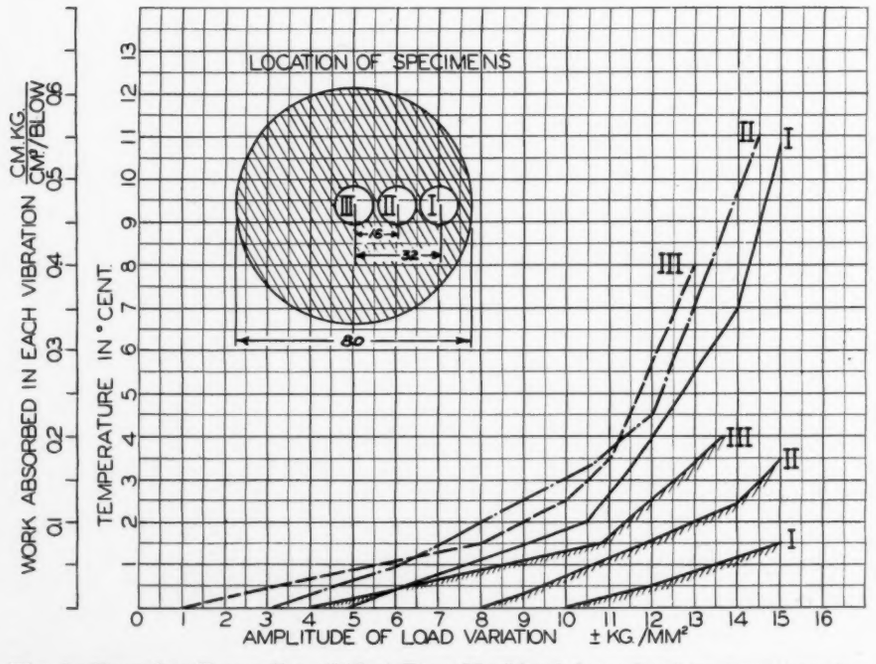


Fig. 1—Damping Properties of Test Bars Machined from Various Locations in a 80-m.m. Diameter Bar

Camshafts

The chief reason for the use of cast camshafts is their cheapness. To obtain a machinable shaft with hard cams, three methods are used: (1) a cast iron of average hardness is used and the cams are hardened by metal chill blocks in the mold; (2) a low alloy iron casting is made and the cams are flame hardened; (3) or the moisture in the mold varies so that wet sand will chill the cams and dry sand gives machinable metal in the rest of the shaft. The last process requires a very exact control of the metal composition.

Appoint Committee on Sintering Test

THE A.F.A. Foundry Sand Research Committee has appointed a sub-committee designated as 6b8 on Sintering Test. It will be the function of this committee to review the methods of conducting the sintering test and the interpretation of data obtained therefrom. This com-

mittee is being appointed because certain discrepancies in the interpretation of data obtained in the sintering test have come to the attention of the Foundry Sand Research Committee.

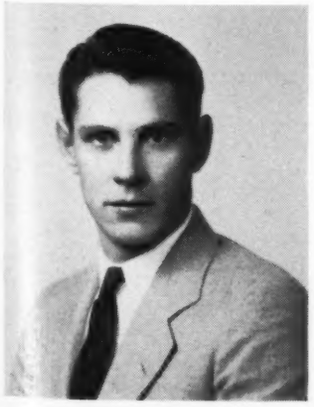
The personnel of the committee is as follows: C. M. Saeger, Jr., National Bureau of Standards, Washington, D. C., *Chairman;* W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.; H. W. Dietert, Harry W. Dietert Co., Detroit, Mich.; A. V. Leun, Bethlehem Steel Co., Bethlehem, Pa.; H. F. Taylor, Research Laboratory, Anacostia Sta., Washington, D. C., and H. C. Schlundt, Columbia Steel Co., Torrance, Calif.

Death of B. B. Wittfoht Loss to Association

BYRON B. WITTFOHT, apprentice training supervisor, Caterpillar Tractor Co., Peoria, Ill., died as the result of an automobile accident near Toledo, Ohio, on Dec. 22. Through Mr. Wittfoht's death, the Association has lost one of its most active and promising members.

A member of the American Foundrymen's Association for a number of years, he had made a distinct place for himself as an outstanding member of the Committee on Apprentice Training and as chairman of the Subcommittee on Development of Standards for Patternmaking Apprenticeship.

Mr. Wittfoht's loss will be felt not only by the Association but by his many friends and associates throughout the industry.



B. B. Wittfoht

Non-Ferrous Division Nominates Officers

AT the 1939 Cincinnati Convention of A.F.A., the Non-Ferrous Division adopted a new set of regulations which state that on the odd-numbered years the chairman of the Division shall appoint a committee to nominate a member of the Division for each of the following offices: Chairman, Vice-Chairman, and three members of the Advisory Committee. In accordance with these regulations, Division Chairman Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, Canada, appointed the following Nominating Committee last year: Sam Tour, Lucius Pitkin, Inc., New York, *Chairman;* M. E. Brooks, Dow Chemical Co., Midland, Mich.; G. K. Eggleston, Detroit Lubricator Co., Detroit.; E. G. Jennings, Canadian Bronze Co., Ltd., Montreal, Canada; and J. W. Kelin, Federated Metals Division, American Smelting & Refining Co., St. Louis.

Canvas of the committee has resulted in the nomination of the following for the above mentioned offices:

For Chairman to Serve for 2 Years—

W. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

For Vice-Chairman to Serve for 2 Years—

W. H. Romanoff, H. Kramer & Co., Chicago.

For Members of the Advisory Committee to Serve for 4 Years—

H. B. Gardner, Bureau of Standards, Washington, D. C.

E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.

J. W. Kelin, Federated Metals Division, American Smelting & Refining Co., St. Louis.

The aim of the committee was to select men who have shown their interest in the work of the Non-Ferrous Division and their ability by their activity in behalf of the Division.

Volume 47 of Transactions Is Ready for Distribution

ANOTHER volume is about to be added to the vast amount of information and data published by the American Foundrymen's Association on the various factors involved in the production of castings. Vol. 47 *Bound Volume Transactions,* containing the papers, reports and discussions of the 1939 Cincinnati convention, is now available and letters and return cards have been sent to members announcing that fact.

In accordance with the publication policy of the Association, *Bound Volume Transactions* are sent to company members gratis on request. Each company member representative is asked to fill out the request card enclosed with the above mentioned letter and return it to the National Office so that his volume may be sent to him.

While personal members receive the material contained in the *Bound Volume Transactions* in the *Quarterly Transactions,* many will want the *Bound Volume Transactions* for permanent reference use. These members may purchase copies of the *Bound Volume Transactions* for $3.00. This charge is made to cover the cost of printing and binding. Price to non-members is $15.00.

Vol. 47 is possibly the most interesting volume of information and data ever issued by the Association because of the wide range of subjects covered. Several points of interest are the symposium on steel making practice, covering acid and basic open hearth and electric furnaces, induction furnace and converter; recommended practices for sand cast high lead bronzes and manganese bronze; a committee report on the effect of high temperatures on the properties of sands; papers on the heat treatment, gating and risering, use of alloys, tempera-

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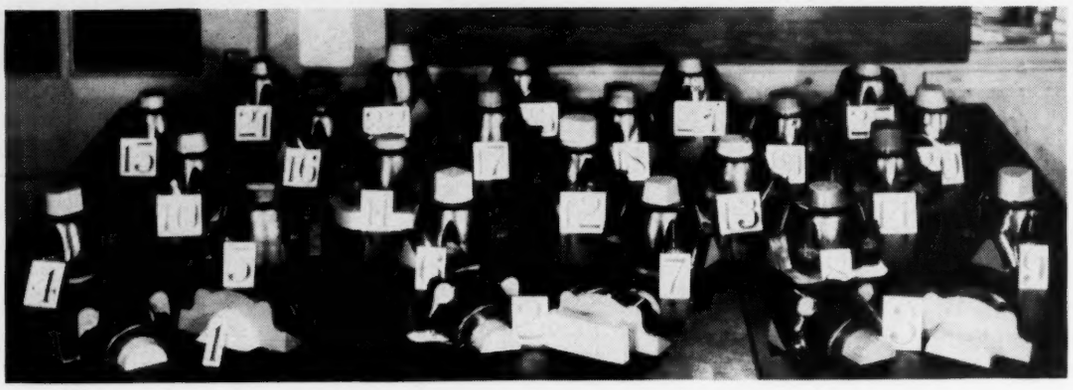


Fig. 1—A Group of Patterns Submitted in the 1939 A.F.A. Patternmaking Apprentice Contest, Showing Core Print Contrasts.

A Resumé of the 1939 Apprentice Patternmaking Contest

By Frank Cech,* Cleveland, Ohio

THE American Foundrymen's Association has endeavored to meet the demands of modern industrial needs and trends throughout its schedule of activities. As one of the paramount needs was and is apprentice training, apprenticeship has occupied a prominent place in Association activities since its early days when a Committee on Apprenticeship was established. Some of the topics that have been discussed and acted upon by the Apprentice Training Committee are:

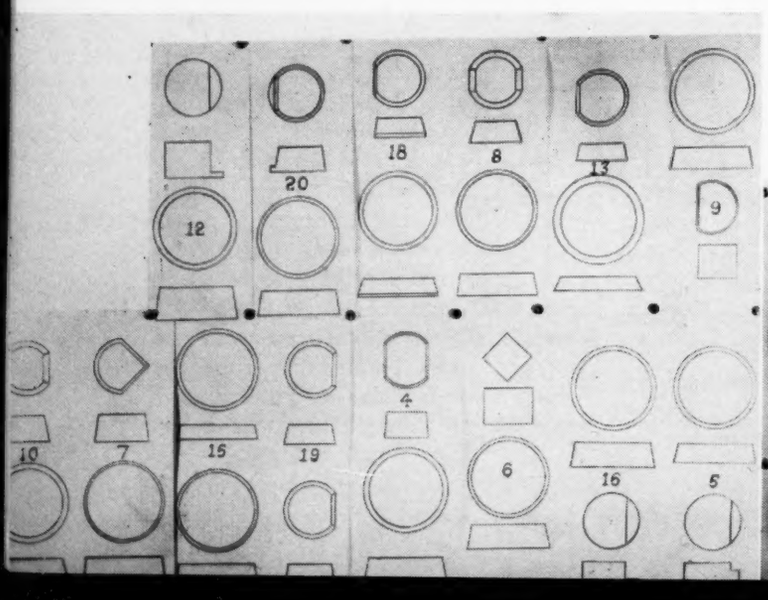
(a) The availability and choice of applicants for apprenticeship.
(b) Qualifications, personality traits and characteristics required of the applicant by the employer.
(c) Suggested standards of apprenticeship for the foundry apprentice.
(d) Suggested standards of apprenticeship for the pattern apprentice.
(e) Type and length of apprenticeship necessary to meet the requirements of the pattern and foundry industry, and
(f) Apprentice contests in patternmaking and molding.

Much may be said and written on any of these topics, but this present discussion deals specifically with the latter, namely, the apprentice contests in patternmaking and molding. A general description of these contests is given first, followed by a discussion of the contest held in conjunction with the Association's 1939 annual convention.

*Instructor in Patternmaking, Cleveland Trade School, and member A.F.A. Apprentice Training Committee.

National Apprentice Contests

The A.F.A. Apprentice committee choses each year, from examples contributed by its members, appropriate projects for contests in patternmaking and molding. These projects are in keeping with a degree of difficulty, type of work and background that may be faced by the average apprentice during his indenture. Announcements concerning the availability of pattern drawings,



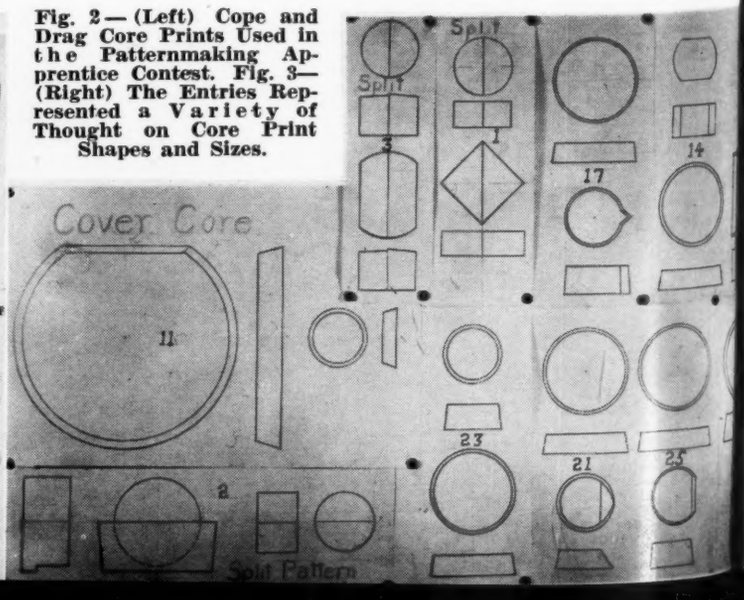


Fig. 2—(Left) Cope and Drag Core Prints Used in the Patternmaking Apprentice Contest. Fig. 3—(Right) The Entries Represented a Variety of Thought on Core Print Shapes and Sizes.

specifications for the contest in patternmaking, the availability of the patterns and coreboxes that are ready for use in the foundry contest, follow. Notification of the contests is made by the committee through the medium of A.F.A. publications, by letter to those voicing interest in past contests, and through local chapters of the A.F.A.

If a locality has but one shop competing, this one shop is allowed but one entry in any one of the classes of competition. Where a number of shops compete, a local contest may be held and three entries, represented by the first, second and third winners of the local contest in any one or more of the classes, may be submitted for final judging. Local entries are sent to the A.F.A. annual convention where they are judged by a committee consisting of experienced patternmakers, foundrymen and educators. First, second, and third prize winners are selected in each class and the winning apprentices are presented with A.F.A. certificates of merit and cash awards, made available through funds contributed by the A.F.A. Board of Awards.

Conducting a Local Contest

To cite an example of how a local contest is conducted, take the case of the Cleveland district where contests in both patternmaking and molding are sponsored by the Northeastern Ohio Chapter of the A.F.A., pattern manufacturers and foundrymen of the Associated Industries of Cleveland. The contest is conducted under the supervision of the Patternmaking and Foundry divisions of the Cleveland Trade School (a public school). To the winners in the local contest, cash awards are presented at the school graduating program. To the Cleveland apprentice winners in the national contest, the national awards and certificates are presented at the annual apprenticeship meeting of the Northeastern Ohio Chapter of the A.F.A. At this annual chapter meeting, outstanding apprentices, along with the winners, are guests of the chapter. Widespread interest by both the apprentices and those in close contact with them, both fellow workmen and executives, has been shown.

Fig. 4—Core-boxes Which Accompanied the Patterns in the Contest.

1939 National Contest Entries

That interest in apprenticeship and the contests is increasing, may be seen by the increase in number of projects submitted and the widely separated parts of the country represented at the 1939 convention. Some 25 patterns, in addition to steel, non-ferrous and gray iron castings, were entered in the national competition. These represented the best from many local contests in which a total of over 150 foundries and pattern shops had boys taking part.

The writer was requested to take all the patterns from this competition and review them, discussing the different methods used by the apprentices. Fig. 1 shows a number of patterns submitted. A great variety of coreprints can be noticed. The different coreprints were drawn to scale size and

Fig. 5—A Committee of Judges Checking Entries in the Patternmaking Division Class Rooms of the Cleveland Trade School. The Judges Are, Left to Right, E. P. Gutman, Standard Pattern Works; Frank Hrabak, East End Pattern Works; George Gedeon, Aluminum Co. of America; Pat Dwyer, Engineering Editor, The Foundry; Walter Seelbeck, Western Pattern Works; Andy Anderle, Motor Patterns Co., all of Cleveland.

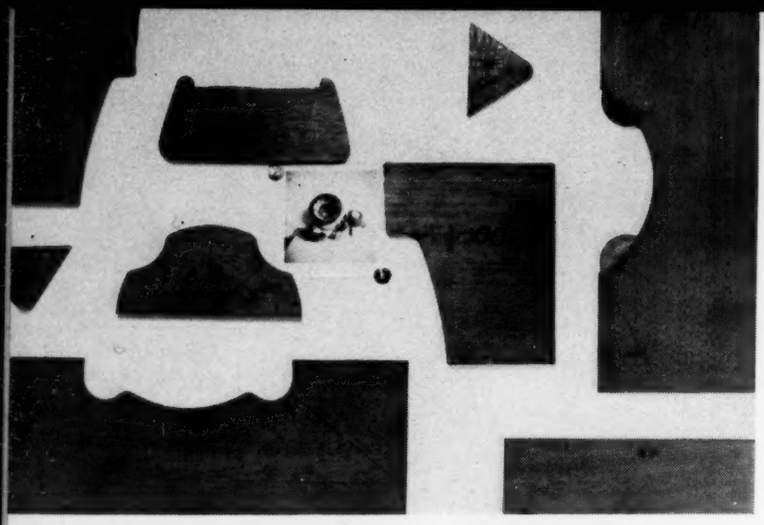


Fig. 6—Templates Used in Checking Entries in the 1939 National Pattern Contest.

these are shown in Figs. 2 and 3 to better depict the contrast. Fig. 4 shows an assembly of the coreboxes accompanying the patterns. They are grouped together to emphasize the different methods used in parting the boxes, construction, provision of loose pieces, etc., on a comparative basis.

Purpose of Contests

The purpose and objective of these contests is: First, to cultivate a personal appreciation for good work; second, to induce the apprentice to strive to develop skill and accuracy by awakening in him a desire for improvement; and third, to awaken the apprentice to the fact that the time element is involved in producing a good piece of work.

These objectives are considered by the judges who try to give the apprentice the break, yet keep all judgment on a fair and impartial plane.

Fig. 5 shows a committee of judges engaged in an individual checking procedure in the Cleveland Trade School patternmaking division classroom. It is inspiring to see these men devoting their sincere efforts to checking patterns submitted in a local contest. There is no more difficult problem in checking than the one presented by a number of similar jobs in a pattern contest. Individual opinions, established customs of procedures of construction, conflicting possibilities of molding and coring that are always based on past experiences or on some foundryman's pet method, limits of accuracy as practice in a particular shop, probably involved in a provincial industry—these and many other intangibles affect the judge's opinion. The apprenticeship committee has made suggestions for the judges to maintain a uniform level of thought. Fig. 6 shows templets that were used in checking the patterns presented at the 1939 National contest to maintain standards of judgment.

Judges Comments on Patterns

Comments made by the judges of the local contest were later compiled and edited by the author, and a summary is given below.

Pattern No. 1 (Fig. 7)

The equipment was a split pattern having a square coreprint split across corners to insure a good core set, with a half dump corebox having one loose piece. In actually making a core from this core box, it was found that the bosses were backdraft. The casting was left with a slight fin on the parting line and on the bottom of casting which detracted nothing from its usefulness, as it was a machined surface.

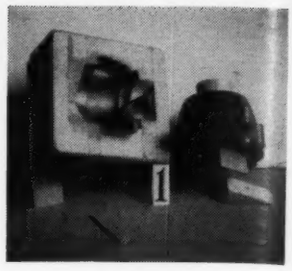


Fig. 7

Of seven judges reporting, three reported pattern as poor, two reported job as fair, one reported pattern was not neat enough, and one reported it as a good job.

Pattern No. 2 (Fig. 8)

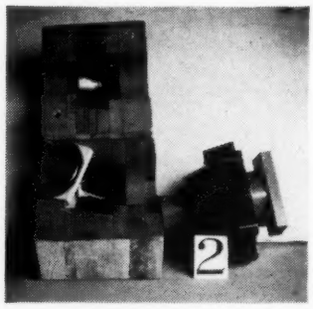


Fig. 8

A split pattern with round coreprints which guarantees core cutting through evenly, yet insures a good seat and location. The corebox is of the full-parted type with loose pieces. The loose pieces have a square seat that maintains position but which is likely to stick and bind and is especially difficult to keep free of sand. There was a slight backdraft on bosses.

Of seven judges, two reported the pattern as fair, and five as good, all found a slight backdraft.

Pattern No. 3 (Fig. 9)

A split pattern turned of one piece with fitted lugs and bosses, including a cope shaving strip (clearance) to facilitate closing over. The corebox is of the half dump type with half-round loose piece that is hard to keep in position because of its tendency to rock and the impossibility of it staying put, as it has no beveled retaining seat.

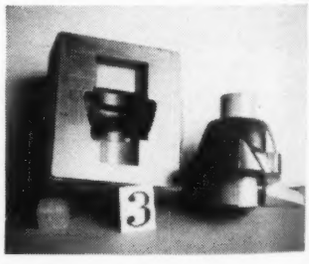


Fig. 9

Of seven judges, four reported job as fair and three as a good job. One of the judges was captivated by construction of the corebox.

Pattern No. 4 (Fig. 10)

A solid pattern with loose cope coreprint so located that a reversal of coreprint is possible, causing a 1/32-in. discrepancy, which is hardly discernible to the naked eye but which may be the cause of a

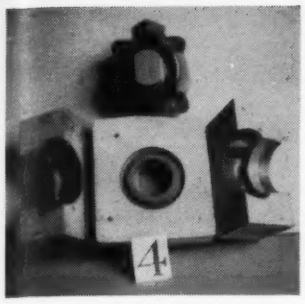


Fig. 10

lot of trouble. The corebox is made of two parted halves, located on a bottom board that contains the drag print within it.

Of seven judges reporting, six pronounced this job as fair, while one said the construction was impractical.

Pattern No. 5 (Fig. 11)

Job construction is good. There was no taper or draft on drag print and the witness key or tell-tale was so small as to be of no practical use, consequently a totally blind set. Neatness of finish was conspicuous because of its absence.

Of seven judges, four report poor, other three cited above notes.

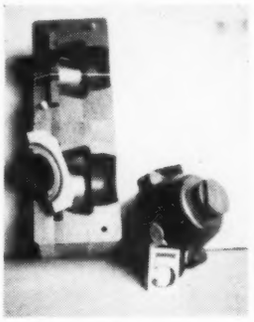


Fig. 11

Pattern No. 6 (Fig. 12)

Of seven judges, three reported good, three fair, and one said job was not practical. The square drag print makes for easy locating and the one dowel in cope coreprint favors speedy production. Open end boxes would speed production because of visible draw.

Fig. 12

Pattern No. 7 (Fig. 13)

Of seven judges, four reported fair, two good, one not practical. This was one of the best pattern equipments in contest and was neat in workmanship and finish. The corebox halves are open, thereby insuring good vision of pattern draw. Method of molding is not fully understood. It seems to the writer that the long pins are to act as a support for the core plate while rolling the core, but that they would stick long before an order of 27 castings was completed. Iron pins would satisfy requirements much better. The solid coreprint is bad molding practice.

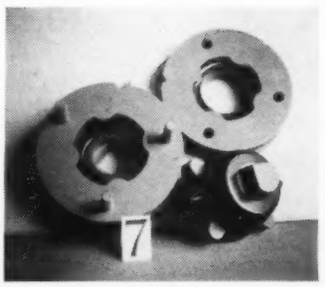


Fig. 13

Pattern No. 8 (Fig. 14)

Of seven judges, six reported the equipment fair, one poor with slipshod workmanship. The small witness mark makes core-setting difficult. The loose piece, while easy to remove, has too much surface to drag on removing it from the box and would tend to stick.

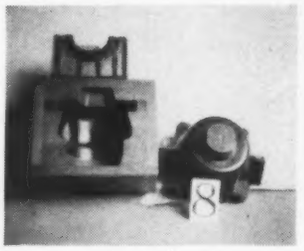


Fig. 14

Pattern No. 9 (Fig. 15)

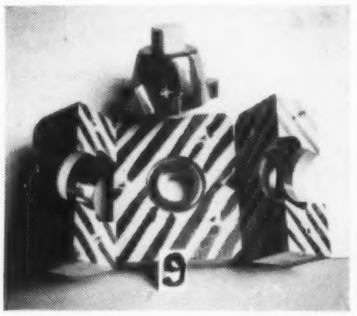


Fig. 15

Of seven judges, one reported the equipment as not practical, one poor, one good, and four fair. The single dowel might well be left off, as it holds back assembly. The workmanship in this equipment is mediocre.

Pattern No. 10 (Fig. 16)

Of seven judges, three reported the equipment good, one criticized it as a pattern with blind set, two reported fair workmanship. Pattern equipment shows need of skill in manipulating hand tools.

Fig. 16

Pattern No. 11 (Fig. 17)

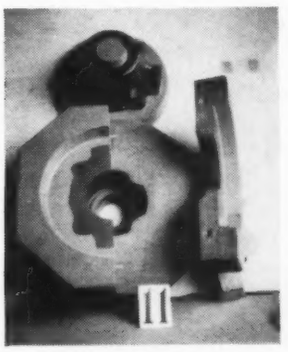


Fig. 17

Of seven judges reporting, five said pattern equipment was good; one said pattern had too much draft on coreprint; one said corebox construction was partly faulty. It seems to the writer that the pattern is hardly in keeping with the order for 27 castings. It is more like a standard job—all it lacks is gating. Casting produced from this equipment was good. *First Prize Winner.*

Pattern No. 12 (Fig. 18) (Is No. 24 in Fig. 4)

All seven judges reported this equipment as a fair job. Drag coreprint should have taper instead

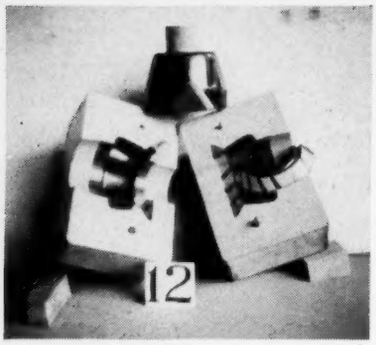


Fig. 18

of being straight. It is difficult to make a blind set of a core with a straight coreprint. One judge reported the job as not practical. Finish of pattern was praised, resembled a lacquered surface.

Pattern No. 13 (Fig. 19)

Of seven judges, two reported the equipment good and one fair. Four judges said that drag coreprint was too short with an insufficient witness mark. One judge reported the corebox as impractical.

Third Prize Winner.

Fig. 19

Pattern No. 14 (Fig. 20)

Fig. 20

Number 14 on corebox assembly in Fig. 4 is corebox 13 and vice versa.

Of seven judges, four reported the equipment as a fair job. There is no taper on drag print. One judge was not satisfied with the locater.

Pattern No. 15 (Fig. 21)

Of seven judges, one reported the equipment as good, two fair, and four said drag coreprint was too short and lacked witness mark. Cope coreprint was tight on pattern.

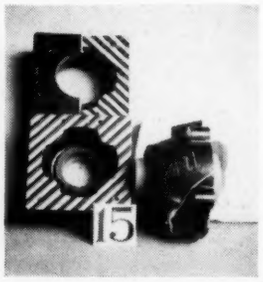


Fig. 21

Pattern No. 16 (Fig. 22)

Of seven judges, two reported the equipment as good, one fair, one poor and two pleaded for taper and more witness mark whereby the core could be set. This was the only pattern equipment having a loose piece in the form of a ring with a beeding or sand frame available. The cope coreprint has only one pin with no taper. Bosses are missing from upper half of corebox ring.

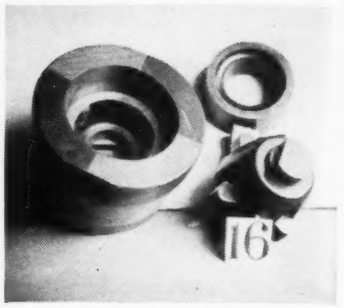


Fig. 22

Pattern No. 17 (Fig. 23)

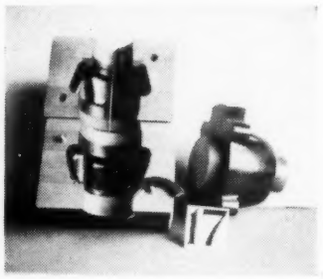


Fig. 23

Of seven judges, four reported that the equipment had a poor witness mark, while three reported the equipment as fair. Pattern equipment lacks neatness of construction.

Pattern No. 18 (Fig. 24)

Of seven judges, one reported the equipment as very good, one good, one fair, one not practical and three reported coreprints as too short and witness marks insufficient. None reported the cope coreprint pins as too tight due to too long a straight section of pin. No. 18 corebox is pictured as No. 23 in Fig. 4.

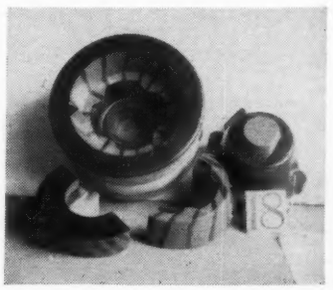


Fig. 24

Pattern No. 19 (Fig. 25)

Fig. 25

In this equipment, the coreprints are too short and the witness mark is poor. Six judges reported the job as fair. One reported a good job. Dowel pins are best in top half. The bottom board should be drilled through. It is unnecessary to turn out chamfered corners, as it is very easily done in the final machining.

Pattern No. 20 (Fig. 26)

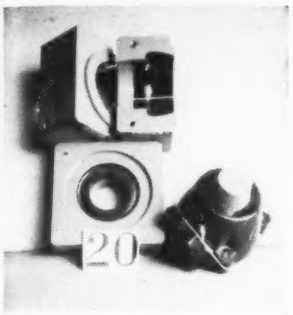


Fig. 26

Of seven judges, four reported the equipment as good, two fair, one poor. The recess in the bottom board can be omitted with no serious handicap, as it is necessary to put in dowels to align core with witness marks. Otherwise the pattern is well made, notwithstanding a solid cope print on the pattern.

Pattern No. 21 (Fig. 27)

Of seven judges, three reported the equipment as good, three fair, one not practical. The coreprint on the drag is short. Workmanship is good.

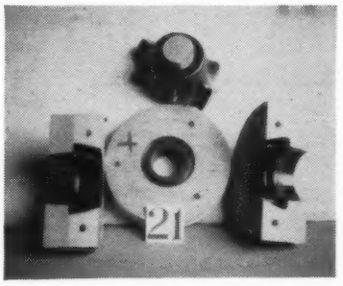


Fig. 27

Pattern No. 22 (Fig. 28)

Fig. 28

Of seven judges, one reported the coreprint too long; one that the witness was on wrong end; one (very good) good workmanship and practical; four a good job. Lugs and bosses are both set in, made of quadrants and turned. The equipment included a rapping plate. This job was made to mold the square coreprint in the drag, then set the pattern on the print and mold the balance in the cope. The casting produced was good.

Pattern No. 23 (Fig. 29)

Of seven judges reporting, one found no witness marks for setting core (bosses must therefore line up), four reported a poor job, two fair, one good and practical. The finish on this equipment was fair. The stock about the core is rather light and consequently too easily broken when rapping corebox. The lack of a witness mark renders the equipment impractical. This was probably forgotten, as it is included in the corebox.

Fig. 29

Pattern No. 24 (Fig. 30)

Of seven judges, two reported the equipment as fair, one good, two poor. The drag coreprint is too straight, bosses are not alike, drag print is short and key is no good. The strange part of this job is the split bottom board. It is difficult to understand the reasoning back of this method of coremaking. The round corner would have to be filled on this core or allowed to remain sharp.

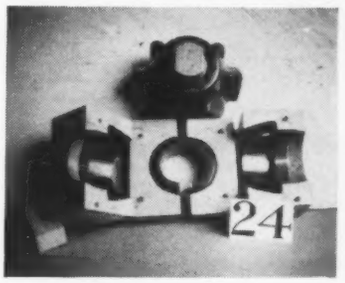


Fig. 30

Pattern No. 25 (Fig. 31)

Fig. 31

Of seven judges, one reported that the job was well designed, six reported it as fair. This drag coreprint is short and the witness mark is poor.

Variation in Judges' Opinions

A variance of opinion may be seen from the reports of the seven judges who make comments on the entries submitted at the national contest. This variance was sincere and honest, inasmuch as the opinions were given separately and without consultation. Opinions will always vary whenever subjective judging is used. Objective test and judgment cannot always be had. The judgment of skill involves intangibles and these are always difficult to measure.

General Comments

In general, the following comments are in order:

(1) Center lines were omitted on patterns.
(2) Drill prints should be used only when specified.
(3) The stock around bosses should be blended to preserve boss shape and size.
(4) The size of the pattern was too small to warrant building up to quadrants.
(5) Short grain should be omitted from all pattern work.
(6) Loose coreprints were fastened by a single centrally located dowel, by two dowels of

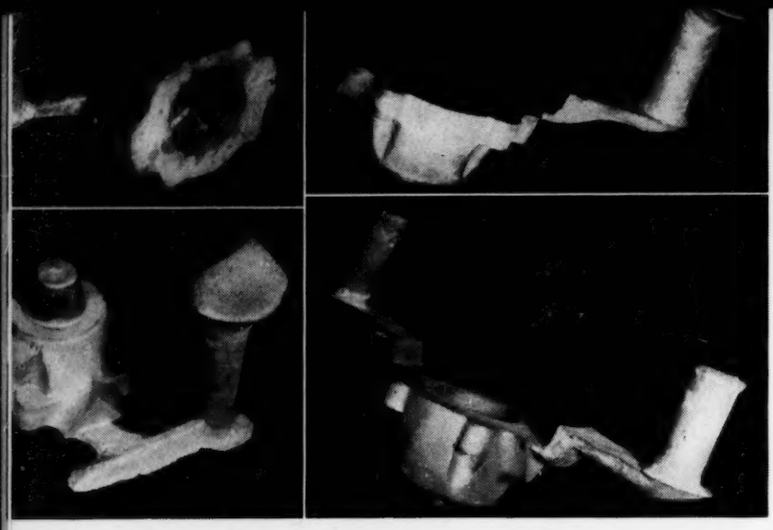


Fig. 32—Castings Produced from Patterns and Core-boxes Selected at Random from Cleveland Trade School Entries in Patternmaking Contest.

equal diameters, or by two dowels of unlike diameters. Of the three methods, the first is the best.

(7) One job had the cope coreprint doweled so that it could be reversed and be seated 1/32-in. out of place. The first two methods of fastening would eliminate this possibility.

(8) A square drag print with sufficient taper makes for the easiest and best set.

(9) Solid cope coreprint is poor molding practice.

(10) Dowel proportions should be observed. A proportion of 1/3 straight section of the diameter of the dowel with the height of the dowel equaling the diameter has proved to be good practice.

(11) Whenever a coreprint is turned of the same blank stock as the pattern, it becomes necessary to chisel it off rather than just prying it off in case of a pattern change.

(12) Solid cope coreprints should not be tolerated.

(13) Loose pieces in a corebox should be well seated to stay in place.

(14) The corner of a loose piece should be removed to take care of any sand that might be left in the seat of the loose piece.

(15) When loose halves of a corebox are located on a bottom board, the dowel holes should be bored into and through the bottom board to make it feasible to clean them when they are clogged with core sand. The bottom board that forms part of the core should be so constructed as to allow a sight draw of the corebox. Thus, the coremaker can always see whether or not the core will draw readily, or break.

(16) A loose piece with cut corners reduces trouble for coremaker by giving clearance for sand.

(17) Different sized dowels are unnecessary on box-halves that cannot be reversed.

(18) Two coreboxes to a core are unnecessary, as they cause extra handling. A full corebox is favored.

(19) A split box with a bottom board should have dowels in one half, otherwise it is harder to assemble.

(20) To keep a box together, use dogs.

(21) A loose-ring loose piece is favored for dump box if cut in two.

(22) Full box, parted in center with open ends, makes for fast production.

(23) Mark corebox so location is easily found.

Conclusion

Fig. 32 shows four castings made from patterns and coreboxes, selected at random from the entries, by the foundry apprentices of Cleveland Trade School. Different methods of gating are shown. The final castings, after being cleaned, look so much alike that it would be impossible to pick the casting to correspond with any pattern and corebox. However, there may be defects which are not seen by the naked eye, but which are discernible only by the x-ray or fluoroscope. These may be the cause of serious failures. The casting made from a pattern correctly designed for foundry production, other things being equal, will produce a better casting than a pattern made with no thought of the foundry. Many patterns are made in a jobbing shop to meet one requirement—first cost.

The patterns submitted presented many ideas and some of them were quite novel. It is natural that some apprentices have some advantages, depending on the company represented, but this is no different than the job will be later on. In the final analysis, the majority of persons familiar with these contests will consider them well worthwhile.

Convention Plans Take Form

(Continued from Page 3)

Plant and Plant Equipment

James Thomson, Continental Roll & Steel Foundry Co., E. Chicago, Ind., *Chairman.*

E. W. Beach, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.

R. D. Brizzolara, American Steel Foundries, Chicago.

W. R. Jennings, John Deere Tractor Co., Waterloo, Iowa.

Refractories

A. H. Dierker, Ohio State University, Columbus, Ohio, *Chairman.*

C. E. Bales, Ironton Fire Brick Co., Ironton, O.

J. A. Bowers, American Cast Iron Pipe Co., Birmingham, Ala.

E. J. Carmody, C. C. Kawin Co., Chicago.

A. E. Cartwright, Robert Mitchell Co., Ltd., St. Laurent, Que., Canada.

A. V. Leun, Bethlehem Steel Co., Bethlehem, Pa.

John Lowe, Vilter Mfg. Co., Milwaukee, Wis.

G. K. Minert, Gunite Foundries Corp., Rockford, Ill.

Patternmaking

Vaughan Reid, City Pattern Works, Detroit, Mich., *Chairman.*

Frank Cech, Cleveland Trade School, Cleveland.

Sand Shop Operation Course

Donald Lee Yost, Budd Wheel Co., Detroit, Mich., *Chairman.*

D. Frank O'Connor, Walworth Co., S. Boston, Massachusetts.

E. E. Woodliff, H. W. Dietert Co., Detroit, Michigan.

Gray Iron Shop Operation Course

John Grennan, University of Michigan, Ann Arbor, Mich., *Chairman.*

P. T. Bancroft, Moline, Ill.

C. O. Butler, Warren Pipe Co. of Mass., Inc., Everett, Mass.

R. F. Hine, Studebaker Corp., South Bend, Ind.

K. H. Priestley, Eaton-Erb Foundry Div., Eaton Mfg. Co., Vassar, Mich.

J. A. Woody, American Cast Iron Pipe Co., Birmingham, Ala.

A. S. Wright, Hunt-Spiller Mfg. Corp., Boston, Massachusetts.

NEW MEMBERS

Company

National Radiator Co., Johnstown, Pa. (E. W. Longacre, Vice-President & General Manager of Manufacturing.)

Berwind Fuel Co., Chicago, Ill. (Harold E. Bodman, Sales Manager).

C. & G. Foundry & Pattern Works, Indianapolis, Ind. (N. E. Baker, General Manager).

Crawfordsville Foundry Co., Crawfordsville, Ind. (Chas. H. Cochran, Secretary).

Sheffield Foundry Co., Chicago, Ill. (A. F. Zitzewitz, Treasurer).

Terre Haute Malleable & Mfg. Corp., Terre Haute, Ind. (M. D. Yatsko, Secretary).

Personal

T. E. Addis, Foreman (Steel), Newport Shipbuilding & Dry Dock Co., Newport News, Va.

Roy M. Allen, Consulting Engineer, Bloomfield, New Jersey.

James Barrett, National Malleable & Steel Castings Co., Indianapolis, Ind.

Ross A. Benham, Production Dept., Swayne, Robinson & Co., Richmond, Ind.

Wilfred M. Bucher, Production Dept., Swayne, Robinson & Co., Richmond, Ind.

Wm. R. Cannon, Vice-President, Camden Foundry Co., Camden, N. J.

John J. Clendenning, National Malleable & Steel Castings Co., Indianapolis, Ind.

John Roy Cochran, Metallurgist, Sundstrand Machine Tool Co., Foundry Div., Rockford, Ill.

A. W. Cowing, Metallurgist, Swayne, Robinson & Co., Richmond, Ind.

James Dalby, Foundry Supt., Canada Metal Co., Limited, Toronto, Ont., Canada.

Earl J. Eckel, Instructor, University of Illinois, Urbana, Ill.

Edward J. Egan, Jr., Salesman, Federated Metals Division, American Smelting & Refining Co., Cincinnati, Ohio.

John A. Fellows, Fdry. Metallurgist, American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill.

G. R. Harbin, Engineer, National Malleable & Steel Castings Co., Indianapolis, Ind.

A. Heinlein, National Malleable & Steel Castings Co., Indianapolis, Ind.

Geo. E. Hochgesang, Asst. Supt., American Brake Shoe & Foundry Co., Mahwah, N. J.

Andy E. Hough, Salesman, H. M. Hillman Co., Philadelphia, Pa.

Raymond Kelly, National Malleable & Steel Castings Co., Indianapolis, Ind.

Eric B. Kindquist, Asst. Metallurgist, International Nickel Company, Bayonne, N. J.

Walter Krywokulski, Apprentice, International Harvester Co., Chicago, Ill.

Willis S. Ludwick, Fdry. Time Study Clerk, Burnside Steel Foundry Co., Chicago, Ill.

H. P. Mackinnon, Cleveland, Ohio, Great Lakes Foundry Sand Co., Detroit.

Kenneth Mason, Melter, National Malleable & Steel Castings Co., Indianapolis, Ind.

M. J. McCarthy, Supt., Geneva Foundry Corp., Geneva, N. Y.

Fred H. McGee, Chattanooga, Tenn., Salesman, Fanner Manufacturing Co., Cleveland, Ohio.

A. E. Murphy, Indianapolis, Ind., Salesman, Indianapolis Coke-Hickman, Williams Co., Cincinnati, Ohio.

K. F. Polgreen, Minneapolis, Minn., Combustion Engineer, Berwind Fuel Co., Chicago, Ill.

Frank Pollard, Draftsman, National Malleable & Steel Castings Co., Indianapolis, Ind.

Emil G. Schmidt, Asst. Fdry. Supt., International Harvester Co., Indianapolis, Ind.

Frank J. Sedlak, Metallurgist, Ohio Brass Co., Mansfield, Ohio.

Charles H. Shmuate, Core Foreman, National Malleable & Steel Castings Co., Indianapolis, Ind.

Warren F. Simrell, Jr., Asst. Supt., Foundry Dept., Bethlehem Steel Co., Shipbuilding Division, Staten Island, N. Y.

Louis Stevens, Patt. Shop & Brass Fdry. Supt., C. & G. Foundry & Pattern Works, Indianapolis, Indiana.

O. E. Sundstedt, Supt., General Foundry & Mfg. Co., Flint, Mich.

Richard Utz, Asst. Fdry. Supt., National Malleable & Steel Castings Co., Indianapolis, Ind.

Donald Watson, Foreman, Geneva Foundry Corp., Geneva, N. Y.

West Virginia University Library, Morgantown, West Virginia.

Alex H. Wornom, App. Instructor, Newport News Shipbuilding & Dry Dock Co., Newport News, Virgnia.

Foreign

Charles Sydney Gill, Director & Gen'l Mgr., Davy & United Roll Foundry, Ltd., Billingham Co., Durham, England.

D. M. McDonald, Secretary, Metal Trades Employers' Association, Sydney, N. S. W., Australia.

CHAPTER ACTIVITIES

Birmingham Chapter Plans Eighth Regional Conference

THE Birmingham District Chapter has announced the program for its Eighth Annual Regional Conference which, because of the success of its past performances, has become known as "The Big Southern Foundry Meeting." Originally begun as a joint effort of the Birmingham Section of the American Society of Mechanical Engineers and local foundrymen, the staging of this event was taken over by the foundrymen after the formation of the Birmingham District Chapter of A.F.A.

February 22 to 24 are the dates and Tutwiler Hotel, Birmingham, the place. Each year that the conference has been staged, attendance records have grown. In 1939, nearly 700 attended the meetings. An equally large attendance is expected this year because of the excellence of the technical program, the fine plant visitations planned, and the reputation that the chapter has established for its splendid hospitality.

The chapter has issued a cordial invitation to all to attend.

The tentative program for the conference is shown below. Members of committees responsible for the conference are as follows :

Program Committee

Chairman—C. K. Donoho, American Cast Iron Pipe Co.
Vice-Chairman — F. K. Brown, Adams, Rowe & Norman.
H. H. Farr, Sanitary Pipe Co.
Thomas C. Ford, Electro Metallurgical Corp.
E. A. Thomas, Thomas Foundries, Inc.
Robert J. Working, Republic Steel Corp.
W. E. Jones, Stockham Pipe Fittings Co.

Entertainment Committee

Chairman—R. L. Ogden, Stockham Pipe Fittings Co.
Vice-Chairman—Guy Bagley, Republic Steel Corp.
R. R. Deas, Jr., American Cast Iron Pipe Co.
Joe Gilbert, Stockham Pipe Fittings Co.
R. M. Marshall, Woodward Iron Co.
Wayne Nelson, Young & Vann Supply Co.
Aubrey White, Stockham Pipe Fittings Co.
Tom Benners, Jr., T. H. Benners & Co.

Membership Committee

Chairman—J. A. Woody, American Cast Iron Pipe Co.
Vice-Chairman—Harry Mouat, Whiting Corp.
A. S. Holberg, Alabama Clay Products Corp.
H. W. Anderson, U. S. Pipe & Foundry Co.
C. B. Saunders, Tennessee Coal, Iron & R. R. Co.
Dan B. Dimick, Jr., Stockham Pipe Fittings Co.

Registration and Attendance Committee

Chairman—W. Lee Roueche, Jr., McWane Cast Iron Pipe Co.
Vice-Chairman — Howard Nelson, Sloss-Sheffield Steel & Iron Co.
D. L. Booker, National Cast Iron Pipe Co.
George Hayes, Central Foundry Co.
Arthur Lee, Lee Brothers Foundry Co.

Publicity Committee

Chairman—Farrar Hill, Hill & Griffith Co.
Vice-Chairman — Morris Benners, T. H. Benners & Co.
Victor A. Szwed, U. S. Pipe & Foundry Co.
G. M. Harris, Tennesse Coal, Iron & R. R. Co.

Tentative Program
Eighth Annual Foundry Practice Conference
Sponsored by
Birmingham District Chapter of A.F.A.

Hotel Tutwiler, Birmingham, Ala. February 22 to 24

THURSDAY, FEBRUARY 22.

9:00 A. M.
REGISTRATION.

10:30 A. M.
How Do You Sell Your Castings? Speaker—Col. W. W. Rose, Executive Vice-President, Gray Iron Founders Society, Cleveland.

12:30 P. M.
LUNCHEON—R. C. Harrell, Stockham Pipe Fittings Co., Chapter Chairman, presiding.

2:30 P. M.
Safety in the Foundry. Speaker—Warren Whitney, National Cast Iron Pipe Co.

4:00 P. M.
Off-Grade Cast Iron. Speaker—V. A. Crosby, Climax Molybdenum Co., Detroit.

7:30 P. M.
Film—U. S. Steel Technicolor Motion Picture—"Steel—Man's Servant." *Special Entertainment Feature.*

FRIDAY, FEBRUARY 23.

9:00 A. M.
PLANT VISITATION.

2:00 P. M.
Personnel Work in Foundries. Speaker—H. J. Noble, Works Manager, American Cast Iron Pipe Co.

3:30 P. M.
How Sand Affects Physical and Mechanical Properties of Castings. Speaker—H. W. Dietert, Harry W. Dietert Co., Detroit.

7:00 P. M.
CONFERENCE BANQUET. *Toastmaster*—W. D. Moore, President, American Cast Iron Pipe Co. *Speaker*—The Hon. Frank M. Dixon, Governor, State of Alabama. *Subject*—"The Importance to the Nation of the Economic Advancement of the South."

Detroit Chapter Institutes Lecture Course

TO make fundamental foundry information available to students, foundry apprentices, employees, and others interested in the foundry industry in the Detroit district, the Detroit Chapter, in cooperation with the University of Detroit, is sponsoring a course of lectures in foundry fundamentals. The course will begin March 1. Cost to members will be $1.50 and to non-members, $2.50.

The committee in charge of the lecture course is as follows:

F. J. Walls, International Nickel Co., Inc., Detroit, *Chairman.*

A. L. Boegehold, General Motors Research Laboratories, Detroit.

A. J. Herzig, Climax Molybdenum Co., Detroit.

E. K. Smith, Electro Metallurgical Co., Detroit.

R. Schneidewind, University of Michigan, Ann Arbor.

F. A. Melmoth, Detroit Steel Casting Co., Detroit.

A. DiGiulio, University of Detroit, Detroit.

Sessions will be held in the classrooms of the University of Detroit. The tentative schedule for the course is shown in the accompanying box.

Lecture Course on Fundamentals of Foundry Practice

Sponsored by the Detroit Chapter in Cooperation with the University of Detroit

March 1

I. RAW MATERIALS AND THEIR FUNCTIONS IN THE FOUNDRY. *Chairman,* F. J. Walls, International Nickel Co.
- A. Non-Metallic Materials. *Lecturer,* H. W. Dietert, H. W. Dietert Co.
- B. Metallic Materials. *Lecturer,* V. A. Crosby, Climax Molybdenum Co.

March 8

II. CORE ROOM PRACTICE. *Chairman,* A. J. Gonter, Chrysler Corp. *Lecturer,* Fred Weaver, Great Lakes Foundry Sand Co.

March 15

III. MOLDING PRACTICE. *Chairman,* Fred Melmoth, Detroit Steel Casting Co. *Lecturer,* L. G. Korte, Atlas Foundry Co.

March 22

IV. MELTING PRACTICE. *Chairman,* E. K. Smith, Electro Metallurgical Co. *Lecturer,* D. J. Reese, International Nickel Co.

March 29

V. HANDLING OF CASTINGS. *Chairman,* Hutton Haley, American Foundry Equipment Co. *Lecturer,* J. A. Linabury, General Motors Corp.

April 5

VI. MANAGEMENT — FOREMANSHIP — OPPORTUNITIES. *Chairman,* R. G. McElwee, Vanadium Corp. of America. *Lecturer,* Omer Allen, Pontiac Motors Foundry Division, General Motors Corp.

Date to Be Arranged

VII. VISITATION OF FOUNDRY. Ford Motor Company.

Hambley Talks to Michiana Chapter

By R. L. Orth,* Mishawaka, Ind.

IT WAS "Old Home Week" at the Michigan Chapter meeting on January 9, when W. A. Hambley, Allis-Chalmers Mfg. Co., Milwaukee, addressed the chapter in the Bronzewood Room, Hotel LaSalle, South Bend, Ind., on "Cause and Cure of Scrap in Gray Iron." Mr. Hambley is a former resident of South Bend and is well known throughout the Michigan territory. M. F. Doty, Clark Equipment Co., Buchanan, Mich., chapter vice-chairman, presided.

The speaker, in discussing his subject, treated melting, molding, cores, gates and risers, shakeout and handling as separate phases of the casting process. He pointed out that the casting defect committee which has been operating in the plant of his company for the past two years, has listed 38 types of defects. The speaker was of the opinion that the greatest difficulty confronting the foundryman today in the field of casting defects was finding suitable nomenclature for labeling them.

Mr. Hambley showed interesting slides throughout his talk which showed typical defective castings.

*American Foundry Equipment Co.

Wisconsin Chapter to Hold Regional Conference February 15 and 16

ON Feb. 15 and 16, the Wisconsin Chapter, in cooperation with the College of Engineering, University of Wisconsin, will hold a two-day Regional Foundry Conference in Hotel Schroeder, Milwaukee. The program given below is in charge of a committee of which B. D. Claffey, General Malleable Corp., Waukesha, Wis., is chairman, and Prof. E. R. Shorey, dept. of mining and metallurgy, University of Wisconsin, Madison, Wis., is co-chairman. Members of the committee are:

W. J. MacNeill, Federal Malleable Co., West Allis, Wis.

M. J. Carpenter, Carpenter Bros., Inc., Milwaukee.

A. C. Ziebell, Universal Foundry Co., Oshkosh.

Roy M. Jacobs, Standard Brass Works, Milwaukee.

C. A. Gutenkunst, Milwaukee Malleable & Grey Iron Works, Milwaukee.

R. J. Anderson, Belle City Malleable Iron Co., Racine.

Howard Waldron, Nordberg Mfg. Co., Milwaukee.

W. A. Hambley, Allis-Chalmers Mfg. Co., West Allis.

C. E. Silver, Smith Steel Foundry Co., Milwaukee.

Tentative Program
Wisconsin Chapter Regional Conference

THURSDAY, FEBRUARY 15.

9:00—10:15 A. M.

WELCOME by Dean F. Ellis Johnson, College of Engineering, University of Wisconsin, Madison.

10:30—12:00 A. M.

GRAY IRON—*Latest Developments in Coke and Cupola Practice,* B. P. Mulcahy, Citizens Gas & Coke Utility, Indianapolis, Ind.

MALLEABLE—*The Use of Cereal Binders in Core and Molding Sand.* F. J. Faller, Corn Products Co., Chicago.

STEEL—*Heat Treatment and Making Heat-Treated Castings.* R. C. Woodward, Bucyrus-Erie Co., Milwaukee.

NON-FERROUS—*Melting Practice and Pouring.* William George, R. Lavin & Sons, Chicago.

12:00—1:30 P. M.

LUNCHEON—B. D. Claffey, General Malleable Corp., presiding. *Speaker*—Phil S. Hanna, editor, Chicago Journal of Commerce. *Present Day Affairs.*

1:30—3:20 P. M.

GRAY IRON—*Sand Clinic.* Elmer J. Carmody, C. C. Kawin Co., Chicago.

MALLEABLE—*The Selection of Various Types of Scrap for Malleable Melting.* J. H. Lansing, Malleable Founders Society, Cleveland.

STEEL—*Molding and Core Materials for Steel Castings.* H. L. Campbell, American Hoist & Derrick Co., St. Paul, Minn.

NON-FERROUS—*Casting Defects and Their Remedies.* W. H. Romanoff, H. Kramer & Co., Chicago.

3:30—5:00 P. M.

JOINT MEETING—*"Training Tomorrow's Foundrymen." Speaker*—Dean F. A. Kartak, Marquette University College of Engineering, Milwaukee.

FRIDAY, FEBRUARY 16.

9:00—10:15 A. M.

GRAY IRON—*Copper in Cast Iron.* Tom Barlow, Copper, Iron and Steel Development Association, Cleveland.

MALLEABLE—*Shop Practice Meeting.* J. H. Lansing and Prof. E. Touceda, Malleable Founders Society, Cleveland.

STEEL—*Heading and Gating Steel Castings.* F. A. Pritzlaff, Falk Corp., Milwaukee.

NON-FERROUS—*Improving Accuracy and Appearance with Pressure Plate Patterns.* M. E. Kohler, Scientific Cast Products Corp., Cleveland.

10:30—12:00 A. M.

GRAY IRON—*Effect of Sulphur, Manganese and Phosphorus,* John Tissing, C. C. Kawin Co., Chicago.
Graphite Distribution and Effect. Prof. P. C. Rosenthal, University of Wisconsin, Madison.

MALLEABLE—*Shop Practice Meeting*—Continuation of Earlier Session.

STEEL—*Steel Casting Design.* C. W .Briggs, Steel Founders Society of America.

NON-FERROUS—*Aluminum and Brass Sand Control.* H. W. Dietert, H. W. Dietert Co., Detroit.

12:00—1:30 P. M.

LUNCHEON MEETING—Co-chairman E. R. Shorey, University of Wisconsin, presiding. *Speaker*—President C. A. Dykstra, University of Wisconsin. *Education and Business.*

1:30—3:20 P. M.

GRAY IRON—*Scrap Clinic.* C. V. Nass, Fairbanks, Morse & Co., Beloit, Wisconsin.

MALLEABLE—*Second Stage Graphitization.* Prof. R. Schneidewind, University of Michigan, Ann Arbor, Mich.

STEEL—*Deoxidation and Deoxidizers.* C. E. Sims, Battelle Memorial Institute, Columbus, O.

NON-FERROUS—*Magnesium-Aluminum Alloys.* W. E. Sicha, Aluminum Co. of America, Cleveland.

3:30—5:00 P. M.

JOINT MEETING—*"Understanding."* Nathaniel Leverone, Automatic Canteen Co. of America, Chicago.

5:10—5:30 P. M.

FINALE.

Oscar Patzke, Smith Steel Foundry Co., Milwaukee.

Paul Power, Maynard Electric Steel Casting Co., Milwaukee.

Prof. Jos. Oesterle, University of Wisconsin, Madison.

Prof. E. R. Shorey, University of Wisconsin, Madison.

Walter Gerlinger, Walter Gerlinger, Inc., Milwaukee.

John Bing, A. P. Green Fire Brick Co., Mexico, Mo.

Walter Edens, Ampco Metal, Inc., Milwaukee.

H. F. Goodwin, Aluminum Co. of America, Milwaukee.

Don Stephens, H. Kramer & Co., Chicago.

Mr. Waldron is chairman of the gray iron section of the program; Prof. Oesterle, of the malleable program; C. E. Silver, of the steel program, and Mr. Ziebell, of the non-ferrous program.

Cincinnati Chapter Discusses Cores

By E. T. Korten*, Cincinnati, Ohio

IN spite of very disagreeable weather, 65 members of the Cincinnati Chapter assembled on January 9 for dinner at the Gateway Restaurant, Union Terminal, which had been reserved for our exclusive use. Twenty-eight other members arrived in time for the 8 o'clock meeting, which was very encouraging under the circumstances.

A steak dinner was served that was heartily enjoyed by all and as we had a last minute disappointment, our coffee talk was eliminated. A short intermission followed dinner and Chairman Ewig, Cincinnati Milling Machine Co., Cincinnati, called the meeting to order promptly at 8 o'clock. A report of the Christmas Party Committee was presented. Everyone agreed that it was a "real party," which was enjoyed by all.

Three members of the Cleveland Chapter were present as our visitors. These were welcomed and introduced to all.

Our guest speaker, L. P. "Robbie" Robinson, Werner G. Smith Co., Cleveland, was introduced. His talk on the occasion of his second visit to our chapter was

*Secretary, Cincinnati District Chapter, and Reliable Pattern & Castings Co.

of a serious nature, the title being "Some Common Sources of Coreroom Trouble, Their Treatment and Cure." His discourse was unusually interesting and a very attentitve audience was evidence of their appreciation. Much enthusiasm also was evident in the question and answer period that followed.

At the conclusion, our chairman expressed for all of us his appreciation and the appreciation of the Cincinnati District Chapter for a most interesting evening.

Northeastern Ohio Chapter Holds Meeting With Cleveland Engineering Society

By Pat Dwyer,* Cleveland, Ohio

NORTHEASTERN Ohio Chapter opened the new year with a joint meeting of the chapter and the machine design division of the Cleveland Engineering Society at the Tudor Arms, Cleveland, January 11. Chairman Ernest F. Hess, Ohio Injector Co., Wadsworth, Ohio, presided over the first part of the meeting. R. R. Slaymaker, associate professor, applied machine design, Case School of Applied Science, Cleveland, served as chairman of the technical session and introduced the speakers, A. C. Denison, Gray Iron Founders' Society; J. H. Lansing, shop practice engineer, Malleable Founders Society, and F. J. Stanley, Steel Founders Society of America. The joint presentation was based on the important part played by design in the successful functioning of nearly all castings when placed in service and in the actual production of many castings.

Reviewing the gray iron field, Mr. Denison pointed out that while engineers are fairly familiar with the advances made in the steel foundry, they lag behind in a knowledge of how gray iron castings have improved in recent years through scientific control and modern foundry technique. He deplored the tendency on the part of certain customers to specify analysis of the castings. Through actual experience the foundryman knows what combinations of raw materials and melting practice will produce castings with definite physical properties to meet certain conditions of service. Let the customer specify the physical properties he expects, or the service conditions under which the casting is to operate, and let the foundryman use his own judgment in making up, melting and pouring the metal. With a number of slides the speaker showed the application of high strength iron to large gears, dwelt upon the damping capacity, wear resistance, high compression strength and other commendable features. He claimed that, on certain extensive fatigue tests, cast iron automobile crankshafts showed higher value than steel.

Mr. Lansing discussed the subject of design in malleable castings and touched upon some comparisons between malleable steel and gray iron castings. Majority of malleable castings are light and sample castings readily may be broken for examination while in the cast or hard iron state. Following the examination, corrective measures may be taken on the pattern, the gating or feeding method to insure soundness in subsequent castings. Illustrated by a number of slides, he discussed the many forms of casting defects, particularly those traceable to faulty design, and indicated the proper remedial measures to apply.

Discussing the subject of steel castings, F. J. Stanley endorsed the claim made by Mr. Denison that customers should specify the physical properties of the castings, or outline the purpose for which the castings are intended. The chemical analysis quite properly should be left to the discretion of the foundryman. On a large blackboard he demonstrated the faults of many designs which interfere with the normal shrinkage and contraction of a casting. Many of the problems presented in the production of steel castings are so complex that they can be solved only by close cooperation between the designer, the draftsman, the patternmaker and the foundryman.

*Engineering Editor, *The Foundry*.

Chicago Plans for Annual Convention and Foundry Show

WITH the appointment of chairmen of committees to supervise the activities of the 44th Annual Convention of the American Foundrymen's Association to be held in Chicago, May 4 to 10, the Chicago Chapter has initiated plans which will go far toward making this convention notable in the history of a long list of Annual Foundry Weeks sponsored by the Association.

The personnel of the Chicago Chapter Convention Week General Committee is as follows:

Chairman, C. E. Westover, Burnside Steel Foundry Co.

Vice-Chairman, G. P. Phillips, International Harvester Co. (Chairman, Reception Committee)

Over 750 Attended the Annual Christmas Party of the Northeastern Ohio Chapter at Hotel Carter, Cleveland

Treasurer, C. C. Kawin, Chas. C. Kawin Co., Chicago, Illinois.
Secretary, L. L. Henkel, Interlake Iron Corp.
H. W. Johnson, Northwestern Foundry Co. (Chairman, Hotel Committee)
J. J. Fox, Wisconsin Steel Co. (Chairman, Plant Visitation Committee)
H. Kenneth Briggs, Miller & Co. (Chairman, Transportation Committee)
Jas. Thomson, Continental Roll & Steel Foundry Co. (General Chairman, Ladies' Entertainment Committee)
P. V. Martin, Carnegie-Illinois Steel Corp. (Chairman, Annual Dinner Committee)
L. H. Rudesill, Griffin Wheel Co. (Chairman, Chicago Day Committee)
John H. Abbott, Hickman Williams & Co. (Chairman, Special Entertainment Committee)
A. W. Gregg, Whiting Corp. (Chairman, Publicity Committee)
James Suttie, American Steel Foundries (Chairman, Golf Committee)

Working with Mr. Thomson, General Chairman of the Ladies' Entertainment Committee, will be Mrs. C. E. Westover, as chairman, Mrs. G. P. Phillips and Mrs. H. W. Johnson as vice-chairmen.

C. C. Carlton Talks on Labor Before Chicago Chapter

By L. L. Henkel,* Chicago, Illinois

THE December 11 meeting of the Chicago Chapter was held at the Chicago Towers Club (Medinah Club). Reports by the chairman, C. E. Westover, were given on the Regional Conference, Lecture Course and an announcement that the Ladies' Night party would be held February 2, 1940. Mr. Westover called attention to a visitor, Donald J. Reese, International Nickel Co., Inc., New York, who is one of our past chairmen and also past chairman of the Metropolitan New York-New Jersey Chapter.

Garnet Phillips, International Harvester Co., Chicago, chapter program chairman, introduced C. C. Carlton, vice-president and secretary, Motor Wheel Corp., Lansing, Mich., and president, Automotive Parts and Equipment Manufacturers Association. Mr. Carlton gave an excellent talk on business, labor and government relationships, with particular reference to the fact that our national welfare depends upon the preservation of free enterprise and individual initiative. He stressed the fact that the managers of industry duties extend beyond the scope of his business; that is, to bring the public to a realization of industry's problems as well as aiding government in preparing laws for conduct of industry. Comments were made about the various "isms" that are attempting to overthrow our government.

A very interesting discussion was given on labor and its relations to industry, with particular mention about unions and their activities. Seniority rights and individual ability merits were compared. In conclusion, Mr. Carlton stated that industrial management can benefit the consumer, labor and the stockholder by: (1) Long and short term planning of products and of production, (2) use of any research facilities available, (3) intelligent use of business profits for modernizing plant and equipment, and (4) elimination of economic waste.

With reference to industry's responsibility to labor, these facts were enumerated: (1) Continuity of income, (2) employment, retention and promotion according to ability, (3) cooperation to provide protection to employees against hazards of death, old age disability and sickness, (4) safe and healthful working conditions, (5) proper understanding by foreman, (6) a basis for pride end confidence in his job, and (7) means for free interchanging of ideas and negotiations.

C. Skinner, general manager, Automotive Parts and Equipment Manufacturers Association, collaborated with Mr. Carlton in answering questions following the speech.

*Interlake Iron Corp., and Secretary, Chicago Chapter, A.F.A.

Northern Illinois-Southern Wisconsin Hears About the Cupola

By H. C. Winte,* Beloit, Wis.

AUTOMATIC cupola operation by means of controlled combustion was the subject discussed at the January 9 meeting of the Northern Illinois-Southern Wisconsin Chapter in the Faust Hotel, Rockford. G. L. Landstrom, Sundstrand Machine Tool Co., Rockford, chapter chairman, presided.

The speaker was S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago. In discussing his subject, Mr. Massari showed that a certain ratio of CO gave a lower oxidation loss of silicon and

*Technical Secretary, Northern Illinois-Southern Wisconsin Chapter and Fairbanks Morse & Co.

Scenes at the Wisconsin Chapter Christmas Party. Left to Right—(1) Ready for the Floor Show. (2) Ed Roth has a new Title—Announcer. (3) A Private Conference. (4) That Satisfied Look After a Good Meal.
(Photos, Courtesy John Bing, Mexico Refractories Co., Mexico, Mo.)

Meeting of Officers and Directors of Central Indiana Chapter. Left to Right—Seated: L. M. McAnly, Rockwood Mfg. Co., Indianapolis, Director; S. C. Wasson, National Malleable & Steel Castings Co., Indianapolis, Director; S. A. Norrick, Perfect Circle Co., New Castle, Ind., Director; R. A. Thompson, Electric Steel Castings Co., Indianapolis, Secretary; I. R. Wagner, Electric Steel Castings Co., Indianapolis, Chairman; J. P. Lentz, International Harvester Co., Indianapolis, Treasurer; B. E. Gavin, National Malleable & Steel Castings Co., Indianapolis, Vice-Chairman; Emil G. Schmidt, International Harvester Co., Indianapolis, Director; L. E. Davis, Republic Coal & Coke Co., Terre Haute, Ind., Director; H. B. Harvey, Indiana Foundry Corp., Muncie, Ind., Director. Standing: M. B. Falvey, Hoosier Iron Works, Kokomo, Ind., Director; R. L. McIlvaine, Swayne-Robinson Co., Richmond, Ind., Director; C. M. Hardy, Hougland & Hardy, Inc., Evansville, Ind., Director. The Only Absent Director Was B. P. Mulcahy, Citizens' Gas & Coke Utility, Indianapolis.

manganese and presented a method to control CO formation in the furnace gases, thereby controlling combustion. By the use of photomicrographs, the speaker also showed some very interesting developments in the metallurgy and heat treatment of cast iron.

Following the talk, a motion picture on the manufacture of carwheels was shown. This film was sponsored by the Griffin Wheel Co., Chicago.

Non-Ferrous Practice Topic at N. Y.-N. J. Meeting

By K. A. DeLonge,* Bayonne, N. J.

THE non-ferrous foundry industry and its products were explored by some 80 guests and members at the January 2 meeting of the Metropolitan New York-New Jersey Chapter, at the Essex House, Newark, N. J. Chairman W. E. Day, Jr., Mack Mfg. Co., New Brunswick, N. J., presided.

Introduced by Technical Chairman H. G. Lamker, foundry superintendent, Wright Aeronautical Corp., Paterson, N. J., Speaker Sam Tour, vice-president, Lucius Pitkin, Inc., New York, briefly surveyed the industry. Mr. Tour pointed out that 3,200 non-ferrous foundries in the United States annually produced some 500,000,000 lbs. of brass, bronze and aluminum castings. He stressed the fact that a large proportion of this metal, 80 per cent in the case of aluminum alloys, is derived either directly from scrap or from secondary ingot metal. Illustrations of various types of scrap were presented in demonstrating the need for careful selection of metal to be used for remelting.

In discussing the effect of the type of metal charged upon the castings produced, Mr. Tour declared that the only difference between smooth and rough top ingot lay in the fact that the former type is protected from surface oxidation during pouring. while the latter is not. Whether one type or the other should be used depends upon the melting practice of the individual foundry. The use of pure metals was deemed more costly and less likely to give uniform results in production. The only advantage ascribable to the use of virgin metals was the obtaining of more uniform colors in red brasses and bronzes.

The speaker described the tentative standard specification for the classification of copper-base alloys adopted by the A.S.T.M and pointed out the difficulties that were being encountered in devising a similar set of standards for aluminum alloy castings because of the complexity of alloy types being used in that field.

Mr. Tour concluded his very interesting and informative talk by discussing general foundry practice dealing with the proportioning of metal charges, melting and deoxidation procedures, the use of satisfactory molding sands and the causes of casting defects. The open discussion which followed centered upon these topics.

Preceding Mr. Tour's talk, an industrial film, "The Manufacture of Non-Ferrous Ingots," was presented through the courtesy of H. Kramer & Co., Chicago.

*International Nickel Co., Inc., and Technical Secretary, Metropolitan New York-New Jersey Chapter.

Officers, Directors and Speakers at the December meeting of the Philadelphia Chapter. Left to right—Vice-Chairman R. J. Keeley, Ajax Metal Co., Philadelphia; J. H. S. Spencer, H. W. Butterworth & Sons Co., Bethayers, Pa.; Harold L. Henszey, Carborundum Co., Philadelphia, Past Chairman; Chairman W. C. Hartman, Bethlehem Steel Co., Bethlehem, Pa.; Dr. P. J. Steinmetz, Rector, St. Paul's Church, Elkins Park, Pa.; Dr. G. H. Clamer, Ajax Metal Co., Philadelphia; C. H. Newcomb, Rogers-Brown-Lavin Co., Philadelphia; Sam Tour, Lucius Pitkin, Inc., New York. *(Photo, Courtesy W. B. Coleman, W. B. Coleman & Co., Philadelphia.)*

Central New York Chapter Completes Course on Cast Iron

By L. D. Wright*, Geneva, N. Y.

THE regular monthly meeting of the Central New York Chapter was held in the Onondaga Hotel, Syracuse, N. Y., Jan. 12, with Chapter Chairman H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y., presiding. This meeting featured the last of four lectures on "The Metallurgy of Cast Iron," presented by F. G. Sefing, International Nickel Co., Inc., New York. The subject of the January lecture was "Foundry Factors Affecting Cast Iron."

This lecture covered the design and service requirements as related to chemical and physical properties of cast iron structures. The chemical analysis, cupola practice, frequent or continuous tapping, ladles, ladle additions of ferro alloys, gas in the metal, non-metallic inclusions, and other practical factors affecting the casting of gray iron were discussed.

Mr. Sefing summarized his lectures with this statement: "It should be remembered that only the best practice in preparing the molten metal for the casting to be made should be used. That foundryman, however, who accepts the challenge to do his best and applies these few important principles of metal preparation and handling finds his product so much in demand that for him there is very little competition. It should be worth our while, therefore, to work toward the elimination of the variables of melting practice so that we may depend upon the composition for particular properties and not upon the fickle whims of fate."

The foundrymen of Central New York agreed that these lectures have been of great value to them and they were presented in such a way that the ordinary foundryman could understand them. To show the appreciation of the foundrymen of Central New York for the personal efforts that Mr. Sefing put into these lectures, a Schaeffer desk set was presented to Mr. Sefing by H. H. Judson, Chapter Chairman.

One of the highlights of this lecture course was the well-prepared notes that Mr. Sefing issued at each meeting, covering the lecture to be presented. Each member has been anxious to obtain these notes for reference work in the future.

A meeting of the officers and directors of the Chapter was held immediately preceding the Chapter dinner, at which time Mr. Judson again discussed the program for the Chapter Chairmen's meeting to be held in Chicago during January.

The officers of the Chapter were much pleased with the attendance at this meeting, as the condition of the roads was such that some thought was given to postponing the meeting. The majority of the members of the Central New York Chapter must travel a considerable distance to attend the meetings.

*Secretary, Central New York Chapter and U. S. Radiator Corp.

Talk on Core Ovens Interests St. Louis Chapter

By J. W. Kelin*, St. Louis, Mo.

C. A. BARNETT, Foundry Equipment Co., Cleveland, Ohio, was the principal speaker at the January 11 meeting of St. Louis District Chapter. This regular monthly meeting was held at York Hotel. Mr. Barnett's subject was "Core Baking and Mold Drying." The talk was well illustrated with a set of slides picturing many installations of core ovens. Mr. Barnett described details of these installations and at the same time gave some very interesting information and pertinent data in connection with core baking.

The coffee talk was given by J. B. Norris, in charge of the St. Louis Office, Federal Bureau of Investigation. His talk gave some interesting information on the F.B.I. He was accompanied by Mr. Lewis of the same organization, who, incidentally, informed the Chapter that he was an A.E.F. "buddy" of Vice-Chairman Carter Bliss (Lieutenant Bliss at that time) and further stated that, to the best of his knowledge, Carter was the only officer in the A.E.F. who found it possible for his men to do away with a whole carload of jam and jelly consigned elsewhere.

During a Board of Directors' meeting that immediately preceded the regular Chapter session, it was voted to set up a substantial prize list for the local apprentice contest which is now under way in anticipation of the final contest of the National organization. This is the first time St. Louis District has done this and we look forward to very interesting results.

*Secretary, St. Louis District Chapter and Federated Metals Division, American Smelting & Refining Co.

Philadelphia Chapter Holds Party

By T. J. Fegley*, Philadelphia, Pa.

ON Friday evening, January 12, Metropolitan Philadelphia Chapter held its first New Year's Party at the Engineers Club. It was a grand success and 282 people were present at dinner—one of the finest turnouts in the history of our Chapter.

The party was arranged for and sponsored by our Entertainment Committee under the able direction of John M. Robb.

After a spectacular and educational industrial film, entitled "Steel—Man's Servant," the tables were cleared away and a galaxy of stars from the leading night clubs of New York and Philadelphia entertained us in delightful fashion. We hope to make this an annual Chapter affair.

*Chairman, Metropolitan Philadelphia Chapter Publicity Committee and North Bros. Mfg. Co.

New England Founders Elect Officers

By M. A. Hosmer*, Boston, Mass.

THE annual meeting of the New England Foundrymen's Association was held in the Engineers Club, Boston, January 10, with Vice-President Francis LeBaron, E. L. LeBaron Foundry Co., Brockton, Mass., presiding. Following the report of the Nominating Committee, the following were unanimously elected to lead the association for the new year:

President — Francis LeBaron, E. L. LeBaron Foundry Co., Brockton, Mass.

Vice-President — Charles Butler, Warren Pipe Co. of Massachusetts, Everett, Mass.

Treasurer—A. W. Gibby, East Boston, Mass.

Secretary — E. F. Stockwell, Co., Cambridge, Mass.

Executive Committee—

Raymond Meader, Whitin Machine Co., Whitinsville, Mass.

A. W. Calder, New England Butt Co., Providence, R. I.

D. F. O'Connor, Walworth Co., South Boston, Mass.

T. C. Weiser, Griffin Wheel Co., Chelsea, Mass.

C. A. Reed, Rogers-Brown-Lavino Co., Cambridge, Mass.

Mr. Reed acted as Chairman of the evening and provided a very fine dinner and entertainment. Everyone appeared to have had a very fine time.

Plans are under way for the Fourth New England Regional Foundry Conference to be held at Massachusetts Institute of Technology, Cambridge, on March 29-30. Although a tentative program has been outlined, plans are not sufficiently complete to permit final publication. The committee in charge of staging the conference is as follows:

C. O. Butler, Warren Pipe Co. of Massachusetts, Everett, Mass., *Chairman.*

A. S. Wright, Hunt-Spiller Mfg. Co., Boston, *Vice-Chairman.*

E. N. Brough, Fairbanks Morse & Co., St. Johnsbury, Vt.

R. F. Harrington, Hunt-Spiller Mfg. Co., Boston.

Prof. P. E. Kyle, Massachusetts Institute of Technology, Cambridge.

Prof. J. M. Lessells, Massachusetts Institute of Technology, Cambridge.

D. L. Parker, General Electric Co., Lynn, Mass.

H. A. Phelps, Phelps Foundry Co., Ansonia, Conn.

Walter M. Saunders, Jr., Providence, R. I.

L. G. Tarintino, Connecticut Non-Ferrous Foundrymen's Association, Bridgeport, Conn.

H. S. Washburn, Jr., Plainville Casting Co., Plainville, Conn.

*Hunt-Spiller Mfg. Co.

Alloys Discussed at Northern California

By G. L. Kennard*, San Francisco, Calif.

ONE of the most enjoyable meetings the Chapter has ever had was that held Friday, January 12, at the Alexander Hamilton Hotel, San Francisco, when a large group of members and friends gathered for a fine dinner.

Chairman Russell was well fortified to his right and left hand, with some of his Committeemen who shared the head table with him.

Mr. Russell took time to give a thorough and interesting report of the Chapter's affairs, and covered the anticipated visit of President Washburn and Executive Vice-President Hoyt, who, with their wives, will make their first visit to California in February to be star numbers on the program of the Steel Conference to be held February 8 and 9 at Del Monte.

Interest shown by members of the Southern California Chapter, as well as our local members and friends, gives promise of a wonderful meeting of Pacific Coast foundrymen, which will probably include a good representation from Oregon and Washington.

Our Chairman also briefly explained the reason for the Association calling all Chapter Chairmen to a Conference in Chicago on January 30, and outlined some of the subjects for discussion.

Our guest speaker, John E. Wilson, Climax Molybdenum, flew in from Los Angeles to arrive promptly at 7:30 p. m. as per schedule and with the aid of a blackboard and the use of lantern slides gave one of the most instructive illustrated talks that our Chapter has had. It was only the late hour that brought the meeting to a close, as many were disappointed that all of the questions they had in mind could not be answered.

*Secretary-Treasurer, Northern California Chapter, and Northern California Foundrymen's Institute.

Connecticut Foundrymen Meet

By H. S. Washburn, Jr.*, Plainville, Conn.

THE December 15 meeting of the Connecticut Foundrymen's Association was held in the Home Club, Meriden, Conn., with J. D. Coltman, Bullard Co., Bridgeport, Conn., president of the organization, presiding. This meeting was devoted to a discussion of foundry cost methods.

The January 26 meeting was held in the same place and the subject for discussion was "A Base Mix for the Jobbing Iron Foundry."

*Plainville Casting Co.

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(Concluded from Page 5)

ture measurement and others on gray iron; malleable annealing in controlled atmospheres, shearing of malleable gates, hydrogen in white iron; symposium on fluidity covering aluminum alloys, cast steel, malleable and gray iron, and many others of both general and specific interest.

Bound Volume 47 of *Transactions* contains over 1,000 pages and is profusely illustrated with pictures, charts and graphs. It will make a welcome addition to any library of foundry practice and technology.

Ridderhof Talks on Facings at Quad City

By J. Morgan Johnson*, Moline, Ill.

THE Jan. 15 meeting of the Quad City Chapter was held in the LeClair Hotel, Moline, Ill., with Herman Alex, Rock Island Arsenal, Rock Island, Ill., chapter chairman, presiding.

The speaker of the evening was Dr. J. A. Ridderhof, Frederic B. Stevens, Inc., Detroit, who spoke on "Foundry Facings." At the opening of his talk, Dr. Ridderhof spoke briefly of the history and development of foundry facings and then branched off into the requirements and properties of various type facings. Partings also were discussed, including charcoal, paper, mill and "rafter" dust, and other compounds used for that purpose. The speaker also spoke of the use of partings in light of health hazards which have been pointed out during recent years.

Many questions were asked by those present. They centered on the permanence of facings when the metal comes in contact with them and coatings for chills. With reference to the latter, many were interested in the treatment of chills to assure proper functioning.

*Secretary-Treasurer, Quad City Chapter and Tri-City Manufacturers Ass'n.

Buffalo Chapter Holds Stag Party

By J. R. Wark,* Buffalo, N. Y.

OUT where the West begins! Members of the Buffalo Chapter have "been thar." Arrayed in 10-gallon hats, corduroy pants, leather boots, and "loud" shirts and neckerchiefs, 333 members and guests of the chapter gathered at the Buffalo Catering Co., Buffalo, on January 12, to enjoy the Annual Stag Party of the Buffalo Chapter. The atmosphere was that of a Western gambling "jrnt" with all the trimmin's. All gambling was done with imitation paper money. A complete buffet luncheon was served throughout the evening and the high spot was the floor show with Art Laird as M. C.

A "typical" Westerner was Bob Molley, chairman of the Stag Committee, with yellow silk shirt, corduroy pants, leather boots and black cowboy hat. Bud Anderson dressed like a Mexican; Bob Glass, chapter treasurer, as an Indian, and Jack Wark as the "slick un" with bright check suit, brown derby, high brown shoes, mustache and large "diamonds." A real time was reported by all.

*Secretary, Buffalo Chapter and Queen City Sand & Supply Co.

Chicago Chapter Hears W. J. Cameron

OVER 300 members and guests of the Chicago Chapter gathered in the Ball-Room of the Chicago Towers Building, formerly the Medinah Club of Chicago, to listen to an inspiring address by W. J. Cameron, Ford Motor Co., Detroit, on Jan. 8. C. E. Westover, Burnside Steel Foundry Co., Chicago, Chapter Chairman, presided. Mr. Cameron was introduced by G. P. Phillips, International Harvester Co., Chicago, Vice-Chairman of the Chapter and Chairman of the Program Committee.

Mr. Cameron gave no title to his address but spoke about business in general, particularly with reference to its attitude toward present conditions. He pointed out that as soon as business abandoned its attitude of wishful waiting for the conditions that existed in the late twenties and assumed an attitude that such conditions could be approached or realized only by dint of its own effort, business improved.

He took issue with those who were disposed to cry out against the cost of distribution for commodities, and pointed out that if each of us had to manufacture all our own necessities and requirements, so much time would be required to gather the materials that little would remain for actual manufacturing operations. He further pointed out that if no distribution agencies were available as they are today, many articles, which the average man regards as necessities, would not be manufactured because they would cost too much. This, of course, would lower our standard of living, which today is the highest in the world.

Southern California Hears About Occupational Diseases

By W. F. Haggman*, Los Angeles, Calif.

THE Southern California Chapter held its January 11 meeting in the Elks Club, Huntington Park, Calif. A. G. Zima, International Nickel Co., Los Angeles, chairman of the chapter, presided, and introduced Dr. J. P. Russell, chief, Industrial Hygiene Service, Department of Public Health, State of California, who presented an extremely interesting discussion of "Occupational Disease Hazards in Foundries."

At the start of his talk, Dr. Russell outlined the conditions, other than accidents, which have a detrimental effect on the health and efficiency of workers. These, he said, include defective illumination, glare from molten metal, excessive heat, sudden temperature changes, and certain gases, fumes and dusts. The speaker then continued by discussing the effects of these various deficiencies on the human body, thus explaining why, in his estimation, they constituted hazards.

In addition to the speaker, a film entitled "Ceiling Unlimited" was shown through the courtesy of the Union Oil Company. It depicted the history of aviation, including tests, races and a flight over the Rockies.

Those present were of the opinion that this meeting was the best ever held by the chapter and paid especial tribute to Dr. Russell, whose talk held the interest of his audience at all times.

*Secretary, Southern California Chapter, and Foundry Specialties Co.

ABSTRACTS

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.

When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Alloy Steel

CASTABILITY. *"Castability of Alloy Steel Castings,"* by R. J. Wilcox, *The Foundry*, vol. 67, No. 12, December, 1939, pp. 28-29, 94, 96. This paper deals with castability, meaning the difficulty or ease with which a particular metal or alloy may be formed into castings. The author has discussed factors affecting the castability of alloy steel which include fluidity; character and degree of shrinkage and solidification; dissolved gases—capacity for and ease of degasification; susceptibility to cracking; and effect on mold refractories. (S.)

Casting

PERMANENT MOLD. *"Modern Permanent Mold Casting,"* by Edward C. Hoenicke, *The Iron Age*, vol. 44, No. 21, November 23, 1939, pp. 47-50. Construction of the mold, application of the refractory coating and thermal treatment given the castings are the points touched upon in this article. To indicate the facility with which complex cored castings, as well as simple solid shapes, can be produced by this method, a number of examples of castings produced by the author's company are shown. (C.)

Cast Iron

CHILL. *"Inverse Chill,"* by F. E. Fisher, *Pig Iron Rough Notes*, No. 78, Autumn, 1939, pp. 13-19, 22. Inverse chill is likely to show in all types of work but is more inclined to be present in light sectioned castings or light furnace work. It is a phenomenon that is not understood but is now believed to be due to pressure of the outer, already hard layer on the metal inside. The paper has brought forward various ideas on the subject as to how this chill is formed and how it may be remedied but it states that such helpful hints will not affect all cases. (C. I.)

FLAME HARDENING. *"Flame Hardening of Cast Iron,"* by Fred G. Sefing, *The Iron Age*, vol. 44, No. 16, October 19, 1939, pp. 43-49. The author, in this report, gives information on extensive experiments conducted to determine the effect of nickel and nickel and chromium additions to cast iron, an effective stress relieving technique, and an adequate flame hardening procedure. Comments also are made on what types of cast iron can be used for lathe bed ways which will flame harden to high hardness (550 Brinell) with little distortion and what depth of hardness can be obtained. (C. I.)

HIGH STRENGTH. *"Cupola Possibilities and Limitations for Making High-Strength Iron,"* by H. W. Gillett and C. H. Lorig, *The Iron Age*, vol. 144, No. 26, December 28, 1939, pp. 17-23, 46. This paper was presented before the Chicago Regional conference of the American Foundrymen's Association and was read by Dr. Gillett. It is pointed out that the demand is growing for high-strength iron and shows why it is best to make a good base iron for alloy additions instead of trying to make a poor iron into a fair one by means of alloys. Statistics are presented on a new material *"Fer X"* as a means of allowing the small foundries to produce high-strength irons economically. (C.I.)

LADLE ADDITIONS. *"Modification of the Properties of Cast Iron in the Ladle,"* by A. J. Nicol Smith, *Bulletin of the British Cast Iron Research Association*, vol. 6, No. 2, October 1939, pp. 37-40. The way of treating cast iron in the ladle, or in the case of the furnace other than the cupola, in the furnace just prior to pouring, can be of great use to foundries. Many methods are established which enable foundrymen to modify a suitable base iron as to make it applicable for a variety of castings and purposes. The purpose of this article is to review and draw attention to some of the methods that are available. (C.I.)

PHOSPHORUS. *"Phosphorus in Pig and Cast Iron,"* by J. G. Pearce, *Pig Iron Rough Notes*, No. 78, Autumn, 1939, pp. 5-7. This is the concluding section of the author's article and he deals with heat-resistance, corrosion-resistance, and wear-resistance of cast and pig iron with certain percentages of sulphur. According to the author cast iron has a corrosion resistance that is second to none and that phosphorus has great wear resisting ability. (C.I.)

Copper

TELLURIUM-SELENIUM-SULPHUR. *"Tellurium, Selenium and Sulphur in Copper Alloys,"* by H. L. Burghoff, *The Iron Age*, vol. 144, No. 23, December 7, 1939, pp. 35-39. Due to the great interest in the development of certain tellurium-bearing copper alloys, this article did appear at the right time. This paper describes the background and work done on tellurium, selenium and sulphur additions to copper alloys, and tabulates the physical characteristics and uses of these alloys. (A1.)

Cupola

LININGS. *"Practical Application of Monolithic Linings in Cupolas,"* by F. Oldershaw, *Foundry Trade Journal*, vol. 61, No. 1216, December 7, 1939, pp. 385-386. This is an abstract of a paper presented to a branch of the Institute of British Foundrymen. Monolithic linings are discussed in detail pointing out that much of the failure has been due to the application and first treatment of the lining before putting the cupola into operation. The article reveals the cupola details, such as size and shape of furnace, how to go about drying the lining, what effect operating details had on the furnace and many other important points. (F.)

MELTING. *"The Cupola and the Melting of Iron,"* by Prof. Girardet, *Foundry Trade Journal*, Vol. 61, No. 1211, November 2, 1939, pp. 299-300. Four principles govern the operation of the cupola: (1) The zone carrying the maximum temperature is that situated above the tuyeres, extending vertically ten times, the average diameter of the pieces of fuel, (2) in the gas which escapes from this region of maximum temperature there is no longer any oxygen, (3) the carbon dioxide which leaves the region of maximum temperature reacts with the hot carbon, through the interstices of which it passes on its way to the throat and produces carbon monoxide and (4) in the throat gases there is a definite and fixed relationship between the contents of all the gases present. The author goes on to discuss these points in detail and brings forth new ideas relating to the subject. (F.)

MELTING FACTORS. *"The Cupola Furnace Process of Melting," Canada's Foundry Journal*, vol. 12, No. 12, December, 1939, pp. 20-21. Position, construction and operation of the slag holes are the main topics discussed in this article. The article gives rules as to why the slag hole should be kept sufficiently below the tuyeres to allow the removal of the slag before it can be run into them. The effective area of tuyeres is also discussed and described. The paper goes on to show that a certain relation of tuyere area to cupola area is necessary to obtain proper penetration of the blast. This article is to be continued. (C.)

Design

CO-OPERATION. *"Co-operation Between Designer and Foundryman,"* by M. Andre, *Foundry Trade Journal*, vol. 61, No. 1206, September 28, 1939, pp. 211-213. The need of co-operation between designer and foundryman is necessary and this co-operation should take in all problems connected with the making of castings, such as material, inspection, shape of the castings, patternmaking and machining. This author has set down basic rules for designing steel castings. These are: (1) general conception of castings, (2) rules concerning design, (3) examination of design detail and (4) the author's view of the possibility and potentialities of a design specification. (D.)

Electric Melting

APPLICATION. *"Electric Furnaces,"* by G. R. Bashforth, *The Iron Age*, vol. 144, No. 24, December 14, 1939, pp. 40-45. This was the presidential address presented before the Staffordshire (British) Iron and Steel Institute, October 24. The history and development, and construction of the various types of electric furnaces are described in this article. Additional data cover the operation of different furnaces, approximate costs, and what alterations in construction and technique may be expected in the future. (F.)

Facings

FOUNDRY. *"Foundry Facings,"* by Dr. J. Ridderhof, *Canadian Metals and Metallurgical Industries*, vol. 2, No. 12, December, 1939, pp. 299-303. Little progress has been made in improving facings when investigations were made as a hit or miss proposition. Today the problem has been taken to laboratories where questions as to why facings exhibited certain characteristics were answered. In this article, it is the purpose to present a picture of various types of facings from an analytical as well as a practical viewpoint. Properties and application of seacoal, core washes, plumbago and parting are discussed. (Mo.)

Furnace

SULPHUR CONTROL. *"Control of Sulphur in Basic Open Hearth,"* by T. L. Joseph and F. W. Scott, *The Iron Age*, vol. 144. No. 21, November 23, 1939, pp. 34-37. Although the general effect of non-metallic inclusions on the physical properties of steels has been frequently discussed, little in the way of quantitative work on the specific effects of these inclusions has been reported. This article makes a compre-

hensive contribution along this line. This first section of this paper gives data regarding the inclusions found in slabs and rejected sheets. (F.)

Heat Treatment

HEAT TREATMENT. *"Induction Heating," Steel,* vol. 105, No. 22, November 27, 1939, pp. 54, 56. Induction heating of inside surfaces followed immediately by a water-spray quench in a newly developed method of hardening inside wearing surfaces on many articles such as cylinders, sleeves, bearings and many other numerous articles. (H.T.)

Magnesium Alloys

MOLDING. *"Molding and Casting Magnesium,"* by A. H. Allen, *Steel,* vol. 105, No. 26, December 25, 1939, pp. 36-38. Important because of their extremely light weight and decreasing cost, magnesium castings are finding many new applications in numerous fields. In this article the latest practice at a plant with a 1500 pound daily output is outlined in detail. (A1.)

Merchandising

SELLING FACTORS. *"The Best Way to Sell Your Castings," Canada's Foundry Journal,* vol. 12, No. 12, December, 1939, p. 10. Hints on the way salesmen could co-operate with the estimating department to increase sales are mentioned. A filing system, used to keep track of all business connections and remarks as to why their trade was won or lost, is a good thing to keep in the estimating offices for future reference and daily business. (C.)

Metallography

STRUCTURES. *"Metallographic Identification of Ferro Magnetic Phases,"* by H. S. Avery, V. O. Homerberg and Earnshaw Cook, *Metals and Alloys,* vol. 10, No. 11, November, 1939, pp. 353-355. Metallurgists working with heat-resistant and other austenitic alloys will find this paper valuable. It is of advantage to be able to identify magnetic constituents in a non-magnetic matrix. The technique developed for this purpose makes use of a colloidal solution which has proved especially useful for the detection of ferrite in austenitic Ni-Cr-Fe alloys. (M.)

Non-Ferrous

AVOIDING DEFECTS. *"Avoiding Defects in the Non-Ferrous Foundry,"* by N. K. B. Patch, *The Foundry,* vol. 67, No. 12, December, 1939, pp. 31-32, 110, 112. This is the first of a series of articles covering the causes of defects in non-ferrous castings, with suggested corrective and remedial measures. The author has classified the two major defects as being those due to design and those resulting from the many variables in the process of preparing molds, melting metals and casting. (N.F.)

AVOIDING DEFECTS. *"Avoiding Defects in the Non-Ferrous Foundry,"* by N. K. B. Patch, *The Foundry,* vol. 68, No. 1, January, 1940, pp. 35, 88, 90. This is the second in this series of articles by the author relating to causes of defective non-ferrous castings with suggested remedial measures. Gates, risers and vents are the points of discussion in this article. Gating of castings is one of the major elements in the production of good castings and erroneous gating or inadequate or misplaced gates may be the source of defective castings. Size of riser in relation to size of casting being poured is an item that may influence the production of a good or bad casting. The venting of molds must be done carefully or blow holes and other defects will be the result. (N.F.)

Pig Iron

DESULPHURIZATION. *"Desulphurization of Pig Iron with Calcium Carbide,"* by C. E. Wood, E. P. Barrett and W. F. Holbrook, *Metals Technology,* vol. 6, No. 8, December, 1939, pp. 1-15. Work has been carried out for some time on the mechanism of desulphurization of iron and steel by slags. The authors went ahead to determine the proportion of sulphur in a slag present as FeS. An investigation was carried out whereby calcium carbide was used also as a desulphurizer and the experiment showed that when a small amount of calcium carbide is properly dispersed through molten pig iron containing sulphur a rapid reaction results. (A.)

Safety

EYES. *"Eyes Are Expensive Targets,"* by K. R. Sutherland, *Steel,* vol. 105, No. 21, November 20, 1939, pp. 52-53, 83. Statistics in this article shows that 72 per cent of all the eye injuries that occur on jobs are regarded as jobs that are non-hazardous to eyes. One plant relates how they cut $45,000 from their yearly eye-accident cost by the use of an effective program for the protection of workers' eyes. (Sf.)

Sand

CONTROL. *"Sand Control for Beginners,"* by M. L. Carl, *Pig Iron Rough Notes,* No. 78, Autumn, 1939, pp. 23-27. Young and old men of the foundry industry who lack knowledge of molding sands and want to secure some information on the subject will find this article a good one on which to get started. It is not technical, but written in a clear concise manner defining all the necessary terms such as moisture, permeability, green compression strength, dry compression strength, green shear strength, dry shear strength, deformation, flowability and many other terms that are used in the study of sand. Most of the information appears to be taken from A.F.A. publications. (Sa.)

Steel

CREEP. *"Creep of Some Chromium-Molybdenum Steels,"* by H. D. Newell, *Metals and Alloys,* vol. 10, No. 11, November, 1939, pp. 342-345. Some time ago three companies co-operated and conducted an investigation of the effect on creep strength of increasing the molybdenum content of familiar 4-6 per cent chromium, ½ per cent molybdenum steel. This final report of the results reveals some interesting facts. (S.)

ELECTRIC MELTING. *"Top Charge Rapid Type Furnaces in the Manufacturing of Plain Carbon Steels,"* by H. H. Watson, *Canadian Metals and Metallurgical Industries,* vol. 2, No. 12, December, 1939, pp. 308-310. The steel industry is increasing its use for the direct arc type furnace. This type furnace has long been accepted as the means of producing the highest grades of both carbon and alloy steels, and it possesses the valuable characteristic of not requiring the purest of raw materials. The increase in the use of this furnace has been due to its saving in power, refractory costs and labor. A typical heat in a top-charge type basic furnace of 5 to 6 tons is followed through step by step and showing the savings it has in operation. (S.)

GASES. *"Gas Content vs. Steel Behavior,"* by George T. Motok, *The Iron Age,* vol. 144, No. 22, November 30, 1939, pp. 25-28. Steel frequently has variations in the same heat or from heat-to-heat and these characteristics are not revealed by routine chemical, metallurgical and physical tests. However, the variations are revealed by Republic's vacuum extraction technique, wherein a study can be made of oxidation products which remain in the steel and determinations made of nitrogen, oxygen, etc. In this article the effect of gases and oxides are pointed out, details of the extraction procedure are given and the case history of variation in the hardenability of a die steel is related. (S.)

Steel Gears

COST. *"Cast Steel Gears,"* by J. A. Shuffstall, *The Foundry,* vol. 68, No. 1, January, 1940, pp. 28-30, 92, 94. To the jobbing steel foundryman cast tooth gears present a problem in pattern construction, molding technique and other phases of manufacture. Modern foundrymen have adopted new manufacturing processes, including proper pattern construction to eliminate the difficulties that arise. This article goes on to show what can be accomplished in order to cut down on time and expense in producing these gears. (S.)

Testing

FATIGUE. *"High Speed Fatigue Testing,"* by R. R. Moore, *Steel,* vol. 105, No. 22, November 27, 1939, pp. 40-41. Since it approaches service conditions, fatigue testing to determine endurance limits proves a versatile tool in studying service failures. The new high-speed machines make complete tests and at the same time require only small specimens. (T.)

X-Ray

AIRPLANE CASTINGS. *"X-Raying Castings for Airplanes," Canadian Metals and Metallurgical Industries,* vol. 2, No. 11, November, 1939, pp. 277-278. Radiographic examination has developed into a very important tool in the inspection of aluminum castings for use in the aircraft field. Many parts require a radiographic inspection; but this method also is used to acquire definite knowledge for improving foundry practice. The author gives a review of the equipment used, general x-ray procedure and the tests made according to their importance. (T.)

Book Review

Modern Blast Cleaning and Ventilation, **by C. A. Reams, 6x9, cloth bound, 213 pp., 38 illustrations, published by the Penton Publishing Co., Cleveland, Ohio. Price $4.00.**

The author has set himself to a big task. In the preparation of the book, he called upon many companies for assistance. The first chapter deals with the development of blast cleaning, while the second discusses the abrasives used. Chapter three deals with the principles of compressed air blast cleaning. The next three explain various methods of abrasive recovery and separation, nozzles, abrasive lines, effect of pressure, air volume, cost of air, effect of moisture in compressed air and various methods of removal. The

next nine chapters deal with various types of abrasive blasting equipment such as those manually operated, blast rooms, barrels, table type and automatic blast cleaning equipment, low pressure blasting, centrifugal blasting, centrifugal wheel blast machines and the installation of compressors and accessory equipment. Four chapters are devoted to ventilation problems in connection with blast cleaning, including types of equipment and system design. Other sections of the book are devoted to reduction of industrial hazards, water blasting, maintaining blast cleaning equipment, foreign blast cleaning developments, selecting blast cleaning equipment, and various factors that aid blast cleaning.

The remainder of the book is of little interest to foundrymen as it deals with the blast cleaning of rolled products. The two chapters on blast cleaning in the porcelain enameling industry and of special alloys and tools may be of interest.

At the end of the book is an appendix which gives a list of "don'ts" for operating blast cleaning equipment, a glossary of terms and a list of uses for blast cleaning. A table of fan efficiency curves also is included in the appendix.

February Chapter Meeting Schedule

February 2

Denver Foundry Meeting
Oxford Hotel, Denver, Colo.
H. S. WASHBURN, Pres. A.F.A.
C. E. HOYT, Exec. Vice Pres. A.F.A.
D. J. REESE, International Nickel Co., New York—*"Cupola Practice"*

✦

Buffalo
Hotel Touraine, Buffalo
VAUGHAN REID, City Pattern Works, Detroit
"Patterns"

✦

Chicago Chapter
Medinah Club, Chicago
"ANNUAL LADIES' NIGHT"

✦ ✦

February 5

Metropolitan New York-New Jersey
Essex House, Newark, N. J.
"Equipment Night"

✦ ✦

February 8

Northeastern Ohio
Cleveland Club, Cleveland
TOM BARLOW, Copper, Iron & Steel Development Assn.
"Copper in Cast Iron"

✦

St. Louis
York Hotel
J. R. ALLAN, International Harvester Co.
"Occupational Disease Hazards"

✦ ✦

February 9

Central New York
Onondaga Hotel, Syracuse
GEO. EVANS, Mathieson Alkali Works
"Cupolas"
H. J. ROWE, Aluminum Co. of America
"Recent Developments in the Casting of Aluminum Alloys"

✦

Metropolitan Philadelphia
Engineers Club, Philadelphia
H. W. DIETERT, Harry W. Dietert Co., Detroit
"Foundry Sand"

✦ ✦

February 12

Chicago
Chicago Towers Building
(Formerly Medinah Club)
M. D. JOHNSON, Caterpillar Tractor Co., *"Castings Inspection"*

Central Indiana
Hotel Washington, Indianapolis
W. B. GEORGE, R. Lavin & Sons
"Non-Ferrous Foundry Practice"
E. W. BUSCH, C. C. Kawin Co.
"Analysis of Casting Defects"

✦ ✦

February 13

Northern California
"President's Night"
H. S. WASHBURN, President A.F.A.
C. E. HOYT, Executive Vice President A.F.A.
D. J. REESE, International Nickel Co., New York
"Cupola Operation"

✦

Northern Illinois-Southern Wisconsin
Faust Hotel, Rockford
Round Table Meeting
JOHN CLAUSEN, Greenlee Bros. & Co., Rockford—*"Cupola Operations"*
G. K. MINERT, Gunite Foundries Corp., Rockford—*"Air Furnace Operations"*
H. C. WINTE, Fairbanks Morse & Co., Beloit—*"Electric Furnace Operations"*

✦ ✦

February 14

Michiana
University of Notre Dame
Joint Meeting with A.S.M.
JEROME STRAUSS, Vanadian Corp. of America
"Metallurgical Applications of Vanadium"

✦

New England Foundrymen's Ass'n
Engineers Club, Boston
T. E. BARLOW, Copper, Iron and Steel Development Assn.
"Copper in Iron"

✦ ✦

February 15

Detroit
Ft. Shelby Hotel, Detroit
RONALD WEBSTER, Hydro-Blast Corp.
FRANK PEDROTTY, American Foundry Equipment Co.
"Wet and Dry Cleaning of Castings"

✦

Southern California
Los Angeles Athletic Club, Los Angeles
"President's Night"
H. S. WASHBURN, President A.F.A.
C. E. HOYT, Executive Vice President A.F.A.
D. J. REESE, International Nickel Co., New York—*"Cupola Operation"*

February 15-16

Wisconsin
Hotel Schroeder, Milwaukee
Third Annual Regional Foundry Conference in Cooperation with University of Wisconsin
(See page 16 for program)

✦ ✦

February 19

Quad City
Ft. Armstrong Hotel, Rock Island, Ill.
Joint Meeting with A.S.M.

✦ ✦

February 22-24

Birmingham
Hotel Tutwiler, Birmingham, Ala.
Birmingham Regional Conference
(See page 14 for program)

✦ ✦

February 23

Ontario
Rock Garden Lodge, Hamilton
Round Table
A. C. TEXTER—*"Steel"*
J. SULLY—*"Non-Ferrous"*
D. J. MACDONALD—*"Cast Iron"*

Regional Conferences

February 8-9

Northern and Southern California Regional Conference
Del Monte, Calif.
(Program, p. 5, January, *American Foundryman*)

✦ ✦

March 22-23

New England Foundry Conference
Massachusetts Institute of Technology
Cambridge, Mass.

✦ ✦

March 30

Rutgers Regional Conference
Metropolitan N. Y.-N. J. and Philadelphia Chapters
Engineering Building, Rutgers University
New Brunswick, N. J.

✦ ✦

April 12-13

Michigan State Foundry Conference
Michigan State College, East Lansing, Mich.

FUNDAMENTAL FOUNDRY INFORMATION

A Partial List of Available A. F. A. Publications

Publication No. 6

Cast Metals Handbook (Second Edition 1940)—

Cloth binding, 532 pp. 6x9, over 350 illustrations, charts and tables. Price $5.00. To members $3.00, one copy gratis on request.

This second edition of Cast Metals Handbook presents additional and revised material to that of the 1st edition issued in 1935. While primarily designed to give engineers and designers reliable working data on the present available properties in cast metals, it is of great value to foundrymen as it enables them to give their customers accurate information in engineering terms. With an introductory section by Prof. H. F. Moore on "The Significance of Strength and Ductility Tests of Cast Metals," it contains other sections on (1) Recommendations to Designers, (2) Recommendations to Buyers of Castings, and (3) Four sections on the Properties, Applications and Specifications of Cast Metals, the fields being steel, malleable, non-ferrous and cast iron castings.

Publication No. 7

Alloy Cast Irons. 200 pp. 6x9, cloth binding (1939). Price $3.00. To members $1.50.

A committee publication, designed to provide foundrymen, purchasers and potential users with comprehensive and authoritative information on the theory, applications, properties and production of alloy cast irons Sections deal with (1) Metallurgical Theory of Effects of Alloying Elements, (2) Qualitative Effects of Alloys, (3) Quantitative Effects on Properties, (4) White and Chilled Alloy Irons, (5) Heat Treatment, (6) Foundry Practice, (7) Specific Applications, giving analysis, mechanical properties and service results of a wide variety of alloy cast irons used in commercial practice, and (8) Bibliography.

Publication No. 50

The Microscope in Elementary Cast Iron Metallurgy, by R. M. Allen.

143 pp. 6x9 preprint, 73 illustrations, (1939). Cloth binding. Price $3.00. To members $1.50.

A book containing material of lectures presented by the author before 1939 A.F.A. Convention. Designed to meet the needs of the shop man and student in understanding the microstructure of cast iron. Discusses the fundamentals of physical cast iron metallurgy, showing extensive illustration of various types of structures. Outlines effect of forms of graphite, silicon, sulphur, manganese and phosphorus. A chapter is devoted to special cast irons such as white, chilled, malleable, alloy, special duty and heat treated. The chapter on the cast iron equilibrium diagram is easily understood. A major section is a detailed explanation of the microscope and technique of its use, together with the preparations of samples.

Publication No. 39-11

Symposium on Steel Melting Practice.

84 pp. 6x9 preprint (1939). Heavy paper binding. Price $1.00. To members $0.50.

A compilation of six papers presented before the 1939 Convention, covering melting practices in the acid and basic open-hearth, acid and basic electric furnaces, the induction furnace and the converter shops. The basic open-hearth practice is treated by J. W. Porter, American Steel Foundries, the acid open-hearth by W. C. Harris, Birdsboro Steel Foundry & Machine Co., the basic electric furnace by C. W. Briggs, Steel Founders' Society of America, the acid electric furnace by W. Finster, Reading Steel Castings Div., American Chain & Cable Co., the induction furnace practice by G. F. Landgraf, Lebanon Steel Foundry, and converter practice by F. B. Skeates, Link-Belt Co. This is the first comprehensive survey of Steel Melting Practices in many years and gives much valuable information to anyone interested in this subject.

Publication No. 39-34

Progress Report on Investigation of Effect of High Temperatures on Steel Sands, by H. L. York.

26 pp. 6x9 (1939). Heavy paper binding. Price $1.00. To members $0.50.

Report of progress of investigation on effects of high temperatures on steel sands as conducted at Cornell University under direction of A.F.A. Steel Division Committee. Purpose of investigation was to determine behavior of certain sand mixtures at elevated temperatures and to acquire information which can be used as a guide in future investigations. Mixtures used were four silica sands bonded with fire clay, bentonite and one natural molding sand. Details of development of furnace given and results obtained on properties at elevated temperatures up to 1500° C.

Publication No. 40

Recommended Practices for Sand Cast Manganese Bronze. Committee Report.

9 pp. 6x9 (1938). Price $0.60. To members $0.30.

This report is limited to sand cast manganese bronze alloys and is divided as follows: (1) Molding, (2) Melting and pouring, (3) Finishing, (4) Heat treatment, (5) Defects, their causes and prevention, (6) Chemical control limits, (7) Typical properties of sand castings, (8) Conforming specifications, and (9) Development and field of use.

Publication No. 39-3

Efficiency in Crucible Melting, by G. K. Eggleston.

14 pp. 6x9 preprint (1939). Price $0.40. To members $0.20.

This paper is an experiment on an understanding of what happens in the flame and the surrounding furnace walls when a metal is melted. The constituents of the flame, the theory of burning, the methods of conducting heat and crucible absorption of heat are explained from a chemical and thermal viewpoint. Experiments were conducted to determine the efficiency of various fuels and the amounts of B.t.u. needed under various circumstances. Data of these experiments are given and discussed.